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10 May 72
by Lawrence J. Porcaro (Westward)
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ANNEX KING

TO

FOURTH MARINE DIVISION
OPERATIONS REPORT

IWO JIMA

4th ENGINEER BATTALION REPORT

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I N D E X

<u>SECTION</u>	<u>TITLE</u>	<u>PAGE</u>
I	PLANNING AND PREPARATION	1 - 2
II	MOVEMENT TO OBJECTIVE	3 - 4
III	SHIP TO SHORE MOVEMENT	5
IV	NARRATIVE OF OPERATION	6 - 21

APPENDIX:

1.	OVERLAYS OF PROGRESS . (1 - 4)	
2.	MINE REMOVAL	22 - 26
3.	WATER SUPPLY	27 - 31
4.	ROAD CONSTRUCTION	32 - 36
V	COMMENTS AND RECOMMENDATIONS	37 - 39

ANNEX

ABLE	ADMINISTRATION	1
BAKER	INTELLIGENCE	1 - 2
CHARLIE	OPERATIONS	1 - 4
DOG	SUPPLY	1 - 3

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SECTION I

PLANNING AND PREPARATION

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Fourth Engineer Battalion . . . Operation Report . . . IWO JIMA

A - ORGANIZATION.

As in past operations the letter companies of the 4th Engineer Battalion were attached to Regimental Combat Teams 23, 24 and 25, as follows:

Company "A"	RCT 25
Company "B"	RCT 24
Company "C"	RCT 23

Headquarters and Service Company and Battalion Headquarters were included in the Support Group for administrative and rear area security purposes. None of the letter companies throughout the operation was ever released to parent control.

B - TRAINING PRIOR TO THE OPERATION.

Due to the severe losses in key and experienced engineer personnel during the Saipan-Tinian operation, a complete and detailed training program was necessary to supply the companies with their minimum requirements in equipment operators, carpenters, riggers and all other basic specialists. Throughout the training program, engineering was stressed, except for the last two weeks during which time the companies concentrated upon infantry and assault training.

The location of the rehabilitation camp provided excellent facilities to train equipment operators since there was much road maintenance to be accomplished plus the construction of a 100 point rifle range and an access road thereto. Mechanics, daily maintenance crews, machinists, welders, surveyors and all personnel required to carry on a large earth moving project benefited by this type of construction.

Numerous carpentry and painting jobs were completed to provide sufficient training of this type. Personnel of the Equipment and Utility Section carried out normal miscellaneous electrical and refrigeration repair work, however, due to limitations of time, considerable pressure was placed upon the four water squads of this section to bring both the equipment and personnel to the highest degree of efficiency possible.

During the period from 1 September to 1 December, a total of 58 separate construction projects ranging from one day to two months' duration were assigned the battalion and completed. The above figure does not include numerous small services furnished units of the Division.

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Fourth Engineer Battalion - Operation Report - IWO JIMA - (cont'd)

Two noteworthy battalion schools for the letter companies were considered especially valuable, these being the rigging school and the mine-laying and removal school. Special emphasis was placed upon the latter which yielded excellent returns on the operation. A Division S.O.P. on mine and minefield marking was conceived, written and published, and each platoon of this battalion was trained in accordance with this directive. All types of Japanese mines combined with every conceivable type of booby-trapped fields were laid and removed with most satisfactory results.

The above described training of this battalion was conducted after a complete reorganization of the Headquarters and Service Company to comply with the new Table of Organization of the Engineer Battalion resulting from the disbandment of the Division's Engineer Regiment, the Twentieth Marines.

C - EQUIPMENT PLANNING.

Upon receipt of notification of the target, a complete study was made of the intelligence material available with a view to taking only such equipment deemed necessary to support the operation. The equipment as shown in ANNEX "DOG" of this report was decided upon at a joint conference of the Battalion Staff and the Company Commanders. In general, after considering the area occupied by this Division and the time required to complete engineer missions assigned during the operation, it can be safely said that the equipment carried for this operation by this Battalion was adequate.

D - MANEUVERS AND REHEARSALS.

Due to the nature of the work performed by engineers and the attachment of the letter companies to the Regimental Combat Teams precluding the operation of the battalion as a unit, very little was gained from the various CPX's which were held prior to embarking. Command post procedures and installations were used as on previous operations and were found to be adequate.

Ship-to-shore rehearsals at the base camp provided some training for the letter companies, however, due to the crowded beach conditions, Battalion Headquarters and Headquarters and Service Company were not landed. Radio communication was established with the engineer letter companies and with the Division and proved satisfactory.

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SECTION II

MOVEMENT TO OBJECTIVE

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Fourth Engineer Battalion - Operation Report - IWO JIMA - (cont'd)

A - REHABILITATION PERIOD.

Due to the restriction placed on the TOP SECRET plans and orders no briefing was provided for the enlisted personnel during this period. Rifle inspections and supervised athletics for the men were conducted daily after which 25 percent of all personnel were authorized liberty.

A conference was held with the Company Commanders to issue final instructions and to make certain that all equipment was accounted for on the various ships to which it was assigned.

A conference called by the FMF,Pac, Engineer Officer was attended by the WAC and the 4th and 5th Division Engineer Officers to discuss final plans for the coordination of all engineering work which was to be accomplished on the island.

Numerous conferences were attended on the Division command ship at which time recent changes in the plans or important phases of the unloading and landing plans were discussed and emphasized.

It is believed that the rehabilitation period at Oahu for this operation was of sufficient length to provide all units an opportunity to prepare themselves for the pending operation.

B - SHIPBOARD TRAINING.

Upon leaving the Hawaiian Area an intensive briefing program was conducted for all of the Headquarters and Service Company officers aboard the APA 157 by the staff of Battalion Landing Team 1/25 and all attached units. All officers attended these school periods, the subject matter of which covered all orders from the Fifth Fleet Order to the Battalion Landing Team Order. School was held for the enlisted men after the officers' classes during which time pertinent information was passed on to the troops. Officers and men of the letter companies, attached to the Combat Teams, received the same type of instruction while aboard their ships. It is generally believed that all hands received more detailed information concerning this operation than any other thus far.

On all ships the relief models were available at all times to small groups of enlisted men at a time under the supervision of an officer who covered the phases of the landing, answered questions

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Fourth Engineer Battalion - Operation Report - IWO JIMA - (cont'd)

and in general, portrayed the initial phases of the landing. Terrain features and orientation land marks were pointed out to further acquaint the personnel with the target.

C - FORWARD AREA REHEARSAL.

As in the Hawaiian Area rehearsals, Headquarters and Service Company and Battalion Headquarters were not boated, however, all orders were prepared in accordance with the rehearsal plans. The letter companies were all boated and no changes were required in the original plan.

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SECTION III

SHIP TO SHORE MOVEMENT

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~~UNCLASSIFIED~~ - 1st Marine Battalion - Operation Report - IWO JIMA - (cont'd)

Headquarters and Service Company and Battalion Headquarters were both to land "upon order". The order to land was to be received from the Support Group. Due to the fact that this company had no assurance as to the type of landing craft which would be used from ship-to-shore, it was necessary to have it divided into platoons, sections, and boat teams. This system provided sufficient flexibility to land organized tactical units with officers in charge of each, regardless of the method of landing.

No landing instructions were issued for this company until D/5 when personnel boarded an LSM at 0930, received orders to land on Blue Beach #1 at 1030, and hit the beach at 1100.

Company "A", attached to Regimental Combat Team 25, was landed by platoons. The first platoon landed in the third and fifth assault waves. The third platoon landed in the fourth and sixth waves. Each of the above platoons landed in four LVT2's. The second platoon landed at 1600 in 2 LCVP's. Sixteen men of Headquarters Platoon landed at H+35 in an LCM with an armored bulldozer. The Company Commander and the Executive Officer landed in the same LCM. The remaining personnel, mostly tractor operators, landed on call and were all ashore by the evening of D+7.

Company "B", attached to Regimental Combat Team 24 which was the Division Reserve, was landed as a company in the Combat Team Support Group. This wave consisted of seven LCVP's and was the "on call" wave "Easy". The company was boated at 1430, D-Day, upon receiving orders from the Regiment, and were landed upon order at 1900 on Blue Beach #1.

Company "C", attached to Regimental Combat Team 23, was landed by platoons with the Battalion Landing Teams to which they were attached. The first and second platoons each landed six men in the second wave. The bulk of the above two platoons were landed in 2 LVT2's each in the fourth wave. The third platoon in one LCVP landed with the Reserve Landing Team at 1330, on D-Day. Headquarters Platoon landed at 1630 on D-Day in 2 LCVP's.

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SECTION IV

NARRATIVE OF OPERATIONS

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Fourth Engineer Battalion - Operation Report - IWO JIMA - (cont'd)

The following narrative summarizes the daily activities of the Fourth Engineer Battalion from 1600 on D-1 until 1600 on D+26 days at which time the organization had completed re-embarkation. Each paragraph covers a twenty-four hour period running from 1600 on the first date indicated until 1600 on the second date. All times are local time.

18 - 19 February

Hq&Serv Company remained aboard ship awaiting orders to land.

Company "A" landed in the assault with its platoons attached to their respective BLT's of RCT-25 on Beach Blue One, and proceeded to remove mines in the beach area.

Company "B" attached to RCT-24, in reserve, boated in 7 LCVP's preparatory to landing.

Company "C" landed in the assault with its platoons attached to their respective BLT's of RCT-23 on Beaches Yellow One and Two. The company cleared lanes for the tanks from the beach area to Airfield No. 1. The armored bulldozer worked on beach egress roads.

19 - 20 February

Company "A" removed mines on Beach Blue Two and executed some demolition missions. A pioneer road was constructed on Beach Blue One.

Company "B" landed at 1900 and went into a reserve position with RCT-24 during the night hours. During the day the platoons removed mines on Beaches Blue One, Yellow One and Two.

Company "C" continued their mine removal operations on the Yellow Beaches. Company "C"'s armored bulldozer assisted the shore party.

20 - 21 February

Company "A" continued to remove mines and execute demolitions in

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Fourth Engineer Battalion - Operation Report - IWO JIMA - (cont'd)

the RCT-25 zone of action. Work was continued on the road leading from Beach Blue One.

Company "B" removed mines in TA 166H.

Company "C" removed mines in TA 165K,L. The armored bulldozer assisted the shore party in moving equipment.

21 - 22 February

Permission to land Battalion Headquarters and Hq&Serv Company was requested but the request was not granted.

Company "A" operated their armored bulldozer on the pioneer road leading from Beach Blue One. The platoons continued to remove mines, where discovered, inland from Beaches Blue One and Two.

Company "B" provided security for the RCT-24 command post.

Company "C"'s platoons returned to engineer company control and executed mine removal, demolition, and road maintenance missions in the vicinity of RCT-23's command post. The armored bulldozer continued to work in the Yellow Beach area.

22 - 23 February

Requested permission to land Battalion Headquarters and Hq&Serv Company.

Company "A" removed mines and executed demolition missions inland from Beaches Blue One and Two.

Company "B" executed mine reconnaissance and removed some mines in TA 183W. The engineers provided command post security during the period.

Company "C" provided command post security, and removed mines from a road in TA 183B. The armored bulldozer filled shell holes and improved roads in TA 181X,Y and TA 164E.

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Fourteen Battalion - Operation Report - IWO JIMA - (cont'd)

23 - 24 February

Hq&Serv Company, less portions of the Equipment and Utilities Section and Quartermaster personnel, landed at 1100 on Beach Blue One. A temporary CP was established at TA 166K from which the company moved to the Battalion CP. Battalion CP was established by 1500 at TA 165R. No equipment came ashore this date.

Company "A" started to construct a road in TA 183W,R to the high ground above the quarry. Mines were removed in the vicinity of the East Boat Basin.

Company "B" carried out demolition missions against caves at TA 183W, X, Y. Mines were removed in TA 166H and TA 183F, G, W.

Company "C" provided security for RCT-23's command post. The armored bulldozer dug revetments for 23rd Marines quartermaster.

24 - 25 February

Individual shelters within the Hq&Serv Company bivouac area were improved and revetments for equipment were constructed. Battalion equipment park was established in TA 165R. Landing of engineer equipment began this date, and work was started on a supply road between Beach Blue One and the Division dump, running through TA 165 X, W, R, Q, V. One TD-18 angledozer was detailed to work on the Division supply road and two TD-18 angledozers dug revetments for equipment in TA 165R and for the water distillation units at TA 149C on Beach Yellow Two. By the end of the period, nine distillation units were ashore, six of which were installed and four were operating. The mine detail from Hq&Serv Company searched the equipment park and the Division supply road for mines and duds.

Company "A" worked on the roads around the quarry. Mine removal and demolition missions were continued in the area around the quarry and the East Boat Basin.

Company "B"'s armored dozer operated on the road in TA 165-C and constructed revetments for the RCT-24 quartermaster. The platoons conducted mine reconnaissance and deactivated and removed mines in TA 183V and TA 166E.

Company "C" conducted mine reconnaissance in TA 183F and TA 183U. Several mines were removed in TA 183F. The bulldozer continued to

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Fourth Engineer Battalion - Operation Report - IWO JIMA - (cont'd)

dig revetments for 23rd Marines quartermaster.

25 - 26 February

Grading of the one lane road from Beach Blue One to the Division dump was completed and 100 feet of beach mat laid at the beach end. Excavation work was started at the proposed Division Hospital site in TA 165K,L. A reconnaissance party investigated the quarry at TA 183W and found the material suitable for road surfacing. One TD-18 angledozer worked on the Division supply road, one TD-18 angledozer was assigned to Company "A" for forward area work and two TD18 angledozers continued the work at the Division Hospital project. Hq&Serv Company mine detail removed mines reported in the vicinity of the 14th Marines command post.

Company "A" worked on roads in the vicinity of the quarry in TA 183W,R,S,T and executed demolition missions against caves in the RCT-25 zone of action.

Company "B" attached to RCT-24 in reserve, was in bivouac in TA 165-O.

Company "C" removed mines in TA 183F, TA 200W,X and executed demolition missions in TA 183D. Work was commenced on a road in TA 183B and construction of a road from RCT-23 command post to quartermaster dump was started.

26 - 27 February

Work continued on the Division Hospital project and work on the revetments for VMO-4 was started in TA 165K. One TD-18 angledozer worked on the VMO-4 revetments and one TD-18 angledozer was assigned to Company "A" for forward area work. Additional waterpoints were established at Beaches Yellow Two and Blue One, TA 149B and 165T, respectively. These new water points were designated Water Points 2 and 3, respectively. All units were dispersed and camouflaged. Operation for the period: Units operating - 12; units under repair - 3; water delivered - 6500 gals; water stored - 3500 gals; water distilled - 10,000 gals. The mine detail searched the area of the Division Hospital and VMO-4 revetments for mines. Enemy shelled the Battalion Command Post area between 2000 and 2100, 26 February, resulting in casualties numbering one dead and two wounded, Two TD-18 angledozers were slightly damaged by fire resulting from the shelling.

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Fourth Pioneer Battalion - Operation Report - IWO JIMA - (cont'd)

Company "A" improved the existing road in TA 183W, removed a hasty mine field in southeast corner of TA 166E, and continued demolition operations in TA 184.

Company "B" remained with RCT-24 in Division reserve.

Company "C" remained in bivouac area at RCT-23 command post. One platoon cleared mines from proposed roadway skirting Airfield No. 2 in TA 200X. Work on the roads started the previous day was completed.

27 - 28 February

The quarry was opened at TA 183W after the area in and around the quarry had been searched for mines. Trucks from the Engineer Battalion and the Fourth Pioneer Battalion started hauling from the quarry at 1300. Work continued on the Division supply road using clay from the quarry for surfacing. Projects at the Division Hospital and the VMO-4 revetments were completed this date. One truck loader tractor operated at the quarry; one TD-18 angledozer completed the work on the VMO-4 revetments; one TD-18 angledozer spread surfacing material on the Division supply road. Water supply operations for the period were as follows: Units operating - 13; units under repair - 4; water delivered - 12,685 gals; water stored - 4100 gals; water distilled - 13,285 gals.

Company "A" continued to improve the existing road in TA 183X and constructed a supply road in TA 184L. The platoons were engaged in mopping-up operations in RCT-25 zone of action.

Company "B"'s armored bulldozer operated in TA 183V,W and TA 166B building and repairing roads. The first platoon remained in its bivouac area; the second platoon was attached to BLT 3-24, and the third platoon was attached to BLT 2-24.

Company "C" searched the roadway from TA 182Y through RJ 184 to CR 249 for mines and executed demolition missions in TA 200Y. The armored bulldozer started improving the road from CR 249 to Airfield No. 2.

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Battalion - Operation Report - IWO JIMA - (cont'd)

28 February - 1 March

Surfacing of the Division supply road proceeded rapidly. The road from TA 165P passing the Division Hospital and running through TA 165G, H, N and connecting with the Division supply road in TA 165R was regraded preparatory to surfacing. Additional work on VMO-4 revetments was started and revetments were constructed for the Division Signal Supply and Division Signal Company. Quarry operations continued. Equipment operating for the period: one TD-18 angle-dozer worked on the Division Signal Supply revetments; one TD-18 angledozer spread clay on the Division supply road; one TD-18 angle-dozer was assigned to Company "A" for forward area work, however it hit a mine and was damaged extensively. One motor patrol grader worked on the road passing Division Hospital. One truck loader tractor and 3/8 cu.yd. motorized shovel worked at the quarry; eight trucks from the Engineer Battalion and five Pioneer Battalion trucks hauled clay from the quarry. Water supply operations for the period were as follows: Units operating - 14; units being emplaced - 3; water delivered - 15,290 gals; water stored - 900 gals; water distilled - 12,090 gals. Water Point No. 4 was established on Beach Blue Two.

Company "A" was with RCT-25 in reserve.

Company "B" attached to RCT-24 carried out normal demolition missions and removed minefield in TA 166A.

Company "C" rested in bivouac area. The armored bulldozer completed the road project started on the previous day.

1 - 2 March

Surfacing of the Division supply road was continued. Surfacing was completed on the road from TA 165X through 165W,R,Q,V,U. The road in TA 148A,E was graded and widened preparatory to surfacing. The road running through TA 165E,G,H,I was regraded and widened. Additional work on the VMO-4 revetment project was completed. Quarry operations continued. Equipment operating during the period was employed as follows: One TD-18 angledozer and TD-18 utility tractor with pull grader on the road in TA 165E,G,H,I; one TD-18 angledozer and motor patrol grader on the Division supply road; two TD-18 angledozers at the VMO-4 project; one TD-18 angledozer at the quarry; 3/8 yard shovel and one truck loader tractor at the quarry; eight trucks, hauling clay. Water supply operations for the period were

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Fourth Engineer Battalion - Operation Report - TWO JIMA - ('cont'd)

operating - 16; units under repair - 3; water delivered - 14,220 gals; water stored - 3,400 gals; water distilled - 16,720 gals. The Hq&Serv Company mine removal personnel continued to work on all road and excavation projects.

Company "A" attached to RCT-25 remained in reserve.

Company "B"'s armored bulldozer worked on roads in TA 183G,B; 165C and 166B. The first and second platoons acted as command post security for their respective BLT's. The third platoon executed assault missions on Hill 382.

Company "C"'s first platoon executed demolition missions against caves in TA 183E. Other platoons of the company were inactive.

2 - 3 March

Surfacing continued on the Division supply road. The road between CR 69 in TA 166B and RJ 184 in TA 183P was graded and improved between RJ 184 and CR 249 in TA 183G. The grading and widening of the road between the Division Hospital and the quarry was completed. The road from the quarry leading to Beach Blue Two was improved and graded. Two additional revetments were completed at the Division Hospital and a 32' x 16' operating room constructed. The disposition of equipment for the period was as follows: two TD-18 angledozers at the Division Hospital; one TD-18 angledozer and motor patrol grader on the Division supply road; one TD-18 utility tractor and pull grader and TD-18 angledozer on the road running from CR 249 in TA 183G to the quarry and from the quarry to Blue Beach Two; motor patrol grader also worked on the road from the Division Hospital to the quarry, completing the grading of this road for two way traffic; one TD-18 angledozer, one 3/8 yard shovel and a truck loader tractor at the quarry; eight trucks continued to haul clay. Water supply operations for the period were as follows: Units operating - 17; water delivered - 10,060 gals; water stored - 8,500 gals; water distilled - 15,160 gals. Mine detail found several mines along the road shoulders between the quarry and CR 249 in TA 183G.

Company "A" carried out normal demolition missions and removed a road block in TA 184W,X.

Company "B" continued work with its armored bulldozer on roadways and craters in the vicinity of Airfield No. 2.

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Fourth Engineer Battalion - Operation Report - IWO JIMA - (cont'd)

Company "C" was inactive during the period except for the armored bulldozer which improved the roadnet in the vicinity of the RCT-23 command post.

3 - 4 March

Surfacing of the Division supply road was completed. Grading of the road between the quarry and CR 249 in TA 183G was completed. Improvement of the road from CR 249 in TA 183G, running through 183F and TA 182J,O,N to CR 263 and then through 182R,X,W to Airfield No. 1 was started. A new road was surveyed and graded in TA 165E,J and TA 183V. Loading operations in the quarry were taken over by 62d Naval Construction Battalion. Equipment of the battalion was employed as follows: One TD-18 angledozer on the Division supply road; one TD-18 angledozer at the quarry; two TD-18 angledozers on the road from Airfield No. 1 to CR 249 in TA 183G; one TD-18 angledozer on the new road project; motor patrol grader on the road between the quarry and CR 249; one TD-18 utility tractor and pull grader on the road from Airfield No. 1 to CR 249; ten trucks hauled clay. The Hq&Serv Company mine detail discovered and removed a large mine field at CR 249. The first platoon of Company "B" and the second platoon of Company "C" were made available by RCT-24 and RCT-23, respectively, to assist the battalion mine detail. Water supply operations for the period were as follows: Units operating - 17; water delivered - 18,155 gals; water stored - 7,645 gals; water distilled - 17,300 gals. A flagpole was constructed and delivered to the Division Cemetery.

Company "A" engaged in mopping-up demolition work and the removal of mines in TA 184X.

Company "B" assisted Hq&Serv Company detail in removing mines at CR 249. Second and third platoons executed demolition missions in TA 201V and TA 201P,Q, respectively.

Company "C" was with RCT-23 in reserve. The second platoon helped Engineer Battalion Headquarters in probing a roadway for mines. The bulldozer was operated on a road in TA 183C,D.

4 - 5 March

The road from CR 249 in TA 183G to Airfield No. 1 was graded.

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The road from TA 183V through TA 165E,J was graded and surfaced with clay. The road from the lateral beach road to Water Point No. 4 was graded and surfaced with clay. The road between TA 165R and N was surfaced with clay. Disposition of the equipment for the period was as follows: One TD-18 angledozer and TD-18 utility tractor with pull grader on the road from CR 249 to Airfield No. 2; one TD-18 angledozer at Water Point No. 4; one TD-18 angledozer and motor patrol grader on the road in TA 183U, TA 165E,J; one TD-18 angledozer on the Division supply road extension; ten trucks hauled clay. Water supply operations for the period were as follows: Units in operation - 15; units under repair - 2; water delivered - 18,130 gals; water stored - 5200 gals; water distilled - 15,685 gals.

Company "A" continued its mopping-up operations in the RCT-25 zone of action.

Company "B" worked on the roads in TA 200V and TA 183D,G. The roadway from CR 249 to Airfield No. 2 was searched for mines. Demolition missions in TA 201V,P,Q were continued.

Company "C" was inactive during the period.

5 - 6. March

Road construction for this date consisted of maintenance of the existing road net. Surfacing of the Division Cemetery was begun using clay from a new quarry opened this date at TA 183W,X. The old quarry was turned over to the 62d Naval Construction Battalion. The flagpole was erected at the cemetery. The Hq&Serv Company's engineer equipment was employed as follows: One TD-18 angledozer and one truck loader tractor at the quarry; TD-18 utility tractor with pull grader and one TD-18 angledozer on road maintenance; one motor patrol grader and two TD-18 angledozers at the Division cemetery project; ten trucks hauled surfacing material. Water supply operations for the period were as follows: Units operating - 16; units under repair - 1; water delivered - 20,670 gals; water stored - 3500 gals; water distilled - 18,970 gals. An angledozer operating in the cemetery struck a deeply buried mine, wrecking the tractor and slightly injuring the operator. Mine detail cleared the new quarry area of mines and duds.

Company "A" graded the old roadway running through TA 183W, R, M and continued demolition and mine removal operations in TA 184.

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North Entrance Battalion - Operation Report - IWO JIMA - (cont'd)

Company "B"'s second platoon continued assault work in TA 201P,Q. The other elements of the company were inactive.

Company "C" returned to the front lines to execute mine and demolition missions in TA 201J,L,N,W. The armored bulldozer improved and graded the road in TA 183G,B.

6 - 7 March

Maintenance of the road net and surfacing of Division Cemetery was continued on this date. Two TD-18 angledozers and one TD-14 utility tractor with pull grader operated on road maintenance. One TD-18 angledozer improved the road from RJ 69 through TA 166C,D,E to the East Boat Basin in TA 167A. The motor patrol grader worked on the Division supply road during the morning. One TD-18 angledozer continued to spread clay at the Division Cemetery project. One truck loader tractor and one TD-18 angledozer continued operations in the quarry. All available trucks hauled surfacing material. The mine detail probed an area around the Division Cemetery for mines and worked on the road to the East Boat Basin; some mines were found at the latter location. Water supply operations for the period were as follows: Units operating - 14; units under repair - 3; water delivered - 17,960 gals; water stored - 4400 gals; water distilled - 18,860 gals.

Company "A" worked on the roadway in TA 184 and continued mine removal and demolition work.

Company "B" did not change its disposition from that of the previous day.

Company "C" performed heavy demolition missions in TA 201E,I,H,N,V. The armored bulldozer graded roadway in TA 182V,T and TA 183P.

7 - 8 March

A forward area supply road from TA 183C through TA 200W,X,S was graded by the TD-18 utility tractor with pull grader. The battalion mine detail probed this road site for mines. One TD-18 angledozer and the motor patrol grader spread clay and graded the road section between the Division Hospital road and the Division supply road. This road passes through TA 165-I,N. Work on the road from TA

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Fourth Engineer Battalion - Operation Report - IWO JIMA - (cont'd)

in TA 166B to East Boat Basin continued with one TD-18 angledozer operating on this job. The truck loader and a TD-18 angledozer continued operation in the quarry. One TD-18 angledozer continued the surfacing job in the Division Cemetery. The mine detail removed four box mines from enemy emplacements in TA 183U. Water supply operations for the period were as follows: Two additional units installed at Water Point No. 4 and one additional unit at Water Point No. 3. Units operating - 15; units under repair - 2; water delivered - 15,675 gals; water stored - 5,700 gals; water produced - 16,975 gals.

Company "A" continued work of the previous day.

Company "B" worked on the road in TA 200S. The platoons remained with their respective BLT's.

Company "C" with all its platoons attached to BLT 2-23 removed mines and performed demolition missions in TA 201E, J, N. The armored bulldozer graded a road passing through TA 183C.D. and TA 200X, T, O.

8 - 9 March

The TD-18 utility tractor with pull grader worked on roads running from the East Boat Basin at TA 167A to RJ 69 in TA 166B through CR 249 in TA 183G to Airfield No. 2, and from CR 249 to CR 263 in TA 182M. Clay surfacing was spread on roads in vicinity of CR 249 with two TD-18 angledozers working in this area. One TD-18 angledozer and the truck loader tractor operated in the quarry. One TD-18 angledozer and motor patrol grader maintained the road from the quarry to the Division Hospital. One TD-18 angledozer continued work in Division Cemetery. One TD-18 angledozer dug two additional revetments for the Division Hospital and three revetments for the Provisional Battalion at TA 182V. Eight trucks hauled clay. Water supply operations for the period were as follows: Units operating - 16; units under repair - 4; water delivered - 18,970 gallons; water stored - 4,800 gals; water distilled - 18,070 gals. Two officers and fifty men were detached from Hq&Serv Company for temporary duty with provisional Battalion, acting as a Division Reserve Battalion and for mopping up in rear areas.

Company "A"'s situation was unchanged from the previous day.

Company "B" started assault work along the beach road in the vicinity of TA 166B. The armored bulldozer operated on roads in

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Fourth Engineer Battalion - Operation Report - IWO JIMA - (cont'd)

TA 201P,V,W,S and 200T,O,X.

Company "C" continued mopping up work of the previous day. The armored bulldozer graded the road in TA 201G,H,M,N,O.

9 - 10 March

The TD-18 utility tractor with pull grader maintained the inland road net. Motor patrol grader engaged in maintenance of the roads in the Division beach area. Quarry operations continued, using the truck loader and one TD-18 angledozer. One TD-18 angledozer dug an additional revetment for the Provisional Battalion at TA 182V. Additional access roads were constructed to Beach Blue Two, clay being spread on these roads and on the beach. Surfacing of the Division Cemetery continued with one TD-18 angledozer working there. Water sprinkler operated throughout the day on the Division rear area roads. Water supply operations for the period were as follows: Units operating - 18; units under repair - 2; water delivered - 19,490 gals; water stored - 6,575 gals; water distilled - 21,265 gals. Two additional units were installed at each of Water Points No. 1 and 2.

Company "A" continued work of the previous day.

Company "B" removed U.S. anti-personnel minefield in TA 184T,Y, and continued mopping-up operations in TA 201W,S,T; TA 202P,U; and TA 184C,D. The armored bulldozer improved the road running through 201V,W,X,S,T and TA 202U.

Company "C" continued to perform demolition missions in TA 202L, Q,V,N. The armored bulldozer continued its work of the previous day and extended the road through TA 201 and TA 202P,Q,V,W.

10 - 11 March

The motor patrol grader maintained the roads in the Division rear area. The water sprinkler worked on the road from the Division Hospital to the Division dump. Twelve trucks hauled clay from the quarry where one truck loader and one TD-18 angledozer were operating. Surfacing of the beach access roads and of Beach Blue Two was continued; one TD-18 angledozer and one TD-18 utility tractor with pull grader spread surfacing material and graded this area. The road on

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Division Battalion - Operation Report - TWO JIMA - (cont'd)

the east-west runway of Airfield No. 2 through TA 183A,B,C; TA 200X was graded. An access road running through TA 165V, TA 149B,C to Water Point No. 1 was constructed and surfaced. Three TD-18 angle-dozers continued grading and excavating in the Division Cemetery. Water supply operations for the period were as follows: Units operating - 20; units under repair - 4; water delivered - 23,170 gals; water stored - 3600 gals; water distilled - 20,195 gals.

Company "A" improved the roads in TA 185P, TA 184C,D,I and TA 201V. Demolition missions were continued in TA 185.

Company "B" improved the road from Higashi Village to RJ 116 and thence right and left to 185L,H. The first platoon was attached to Company "I", 25th Marines for demolition work. The remainder of the company did rear area demolition work around Higashi Village.

Company "C" with all its platoons attached to BLT 1-23 continued mopping-up operations in TA 202W,X,S,N. Mines were removed from the beach in TA 203U. The armored bulldozer graded the road running through TA 202Q,V,W,X and TA 185F.

11 - 12 March

The water sprinkler worked on the road from the Division Hospital to the Division dump running from TA 165L to RJ 184 through TA 165-I,N,R,Q,V,U; TA 149A and 148E. The motor patrol grader was engaged in maintenance of the Division inland road net as far as Airfield No. 2. One TD-18 utility tractor with pull grader graded the Division reembarkation area and access roads at Beach Blue Two and also the road from CR 249 to CR 263 to Airfield No. 1. Quarry operation continued with one truck loader and two TD-18 angledozers. One TD-14 angledozer worked alternately at the quarry and at the Division Cemetery. Eleven trucks hauled clay to the surfacing projects. Water supply operations for the period were as follows: Units operating - 21; units under repair - 3; water delivered - 23,260 gals; water stored - 6250 gals; water distilled - 25,910 gals. Two officers and fifty men rejoined the Battalion from the Provisional Battalion upon its disbandment.

Company "A" continued its operations of the previous day.

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Fourth Engineer Battalion - Operation Report - IWO JIMA - (cont'd)

Company "B" executed demolition missions in TA 202 and TA 185.

Company "C" with all of its platoons attached to BLT 1-23 continued to close the entrances of caves in TA 202K,L,P,Q,S,T,W,X,Y and TA 185D,E.

12 - 13 March

The motor patrol grader continued maintenance of the Division rear area road net. The water sprinkler continued working on the road from the Division Hospital to the quarry and to the Division supply road. One TD-18 angledozer and the TD-18 utility tractor with pull grader worked on the road from TA 165V to Water Point No.1. One TD-18 angledozer spread surfacing on the road from TA 165-I,M,L,Q. One truck loader, two TD-18 angledozers, and one TD-18 utility tractor and ripper operated in the quarry. Two TD-18 angledozers continued operation in the Division Cemetery. The Hq&Serv Company mine detail assisted Company "C" in RCT-23 zone of action removing mines in TA 202P,U. Hq&Serv Company also supplied a 12 man working party to the Division for a Jap burial detail. Water supply operations for the period were as follows: Units operating - 24; units under repair - 3; water delivered - 25,805gals; water stored - 10,200 gals; water distilled - 29,755 gals.

Company "A" was engaged in mopping-up operations in TA 185.

Company "B" removed mines from small fields in TA 185R,S and marked the remainder of a U.S. anti-personnel minefield in TA 184.

Company "C" had all its platoons removing a minefield in TA 202P,Q,U. At 1500 all platoons reverted to company control and moved to bivouac area in TA 182Y.

13 - 14 March

Reembarkation operations started this date. All engineer work with the exception of water supply ceased. A loading detail of 5 NCO's and 50 men were supplied to load the USS KINGSBURY. One officer (loading officer) and 17 men (equipment operators) reembarked aboard the USS KINGSBURY for transportation to base camp. Battalion equipment was prepared for loading. Water supply operations for the period were as follows: Units operating - 23; units under repair - 5;

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Fourth Engineer Battalion - Operation Report - IWO JIMA - (cont'd)

water delivered - 23,360 gals; water stored - 9,925 gals; water distilled - 23,085 gals.

Company "A" continued to execute demolition missions in TA 185.

Company "B" was engaged in mopping-up operations in TA 185.

Company "C" remained in bivouac area.

14-15 March

Preparations for reembarkation continued this date. Shower facilities were constructed at Water Point No. 4 for Fourth Division troops. Water supply operations for the period were as follows: Units operating - 22; units under repair - 5; water delivered - 23,690 gals; water stored - 9,000 gals; water distilled - 22,765 gals.

Company "A" continued operations of the previous day.

Company "B" continued operations of the previous day.

Company "C" remained in rest area.

15-16 March

Five trucks resumed hauling clay to the Division Cemetery. The quarry was now operated by the Third Engineer Battalion. Water supply operations for the period were as follows: Units operating - 22; units under repair - 5; water delivered - 24,720 gals; water stored - 8,765 gals; water distilled - 22,485 gals.

Companies "A" and "B" continued their operations in TA 185. The last elements of organized enemy resistance in the Division area were overcome by nightfall.

Company "C" was embarked aboard APA 177.

16-17 March

Preparations for reembarkation continued. Operation of the water

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Fourth Engineer Battalion - Operation Report - IWO JIMA - (cont'd)

units terminated on this date. Water stored was delivered to the Division dump. Total delivered for this date was 25,750 gals.

Company "A" was embarked aboard APA 172.

Platoons of Company "B" occupied a defensive position in TA 184 during the entire period.

17 - 18 March

Preparations for reembarkation completed. The Battalion Command Post closed at 1600, 18 March and unit moved to Beach Blue Two for reembarkation.

Platoons of Company "B" reverted to company control at 0700.

18 - 19 March

Officers and enlisted men of Hq&Serv Company and Battalion Headquarters reembarked from Beach Blue Two at 2200 and boarded the U.S.S. PICKAWAY, APA 222, at 2400.

Company "B" was embarked aboard APA 222 at 1800.

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APPENDIX 1

OVERLAYS OF PROGRESS

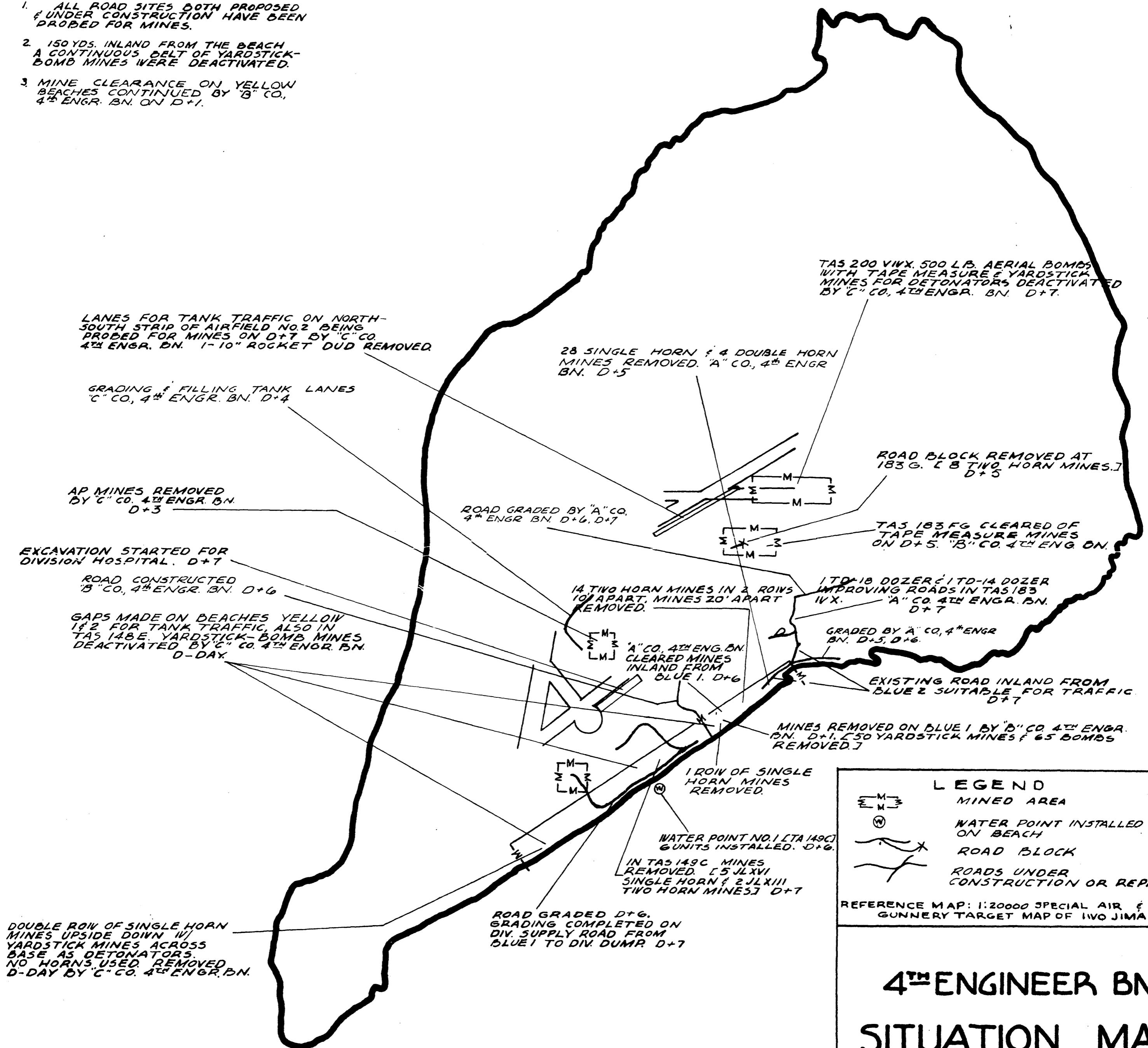
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NOTES:

1. ALL ROAD SITES BOTH PROPOSED & UNDER CONSTRUCTION HAVE BEEN PROBED FOR MINES.
2. 150 YDS. INLAND FROM THE BEACH A CONTINUOUS BELT OF YARDSTICK-BOMB MINES WERE DEACTIVATED.
3. MINE CLEARANCE ON YELLOW BEACHES CONTINUED BY "B" CO., 4TH ENGR. BN. ON D+1.



LEGEND

	MINED AREA
	WATER POINT INSTALLED ON BEACH
	ROAD BLOCK
	ROADS UNDER CONSTRUCTION OR REPAIR.

REFERENCE MAP: 1:20000 SPECIAL AIR & GUNNERY TARGET MAP OF IWO JIMA

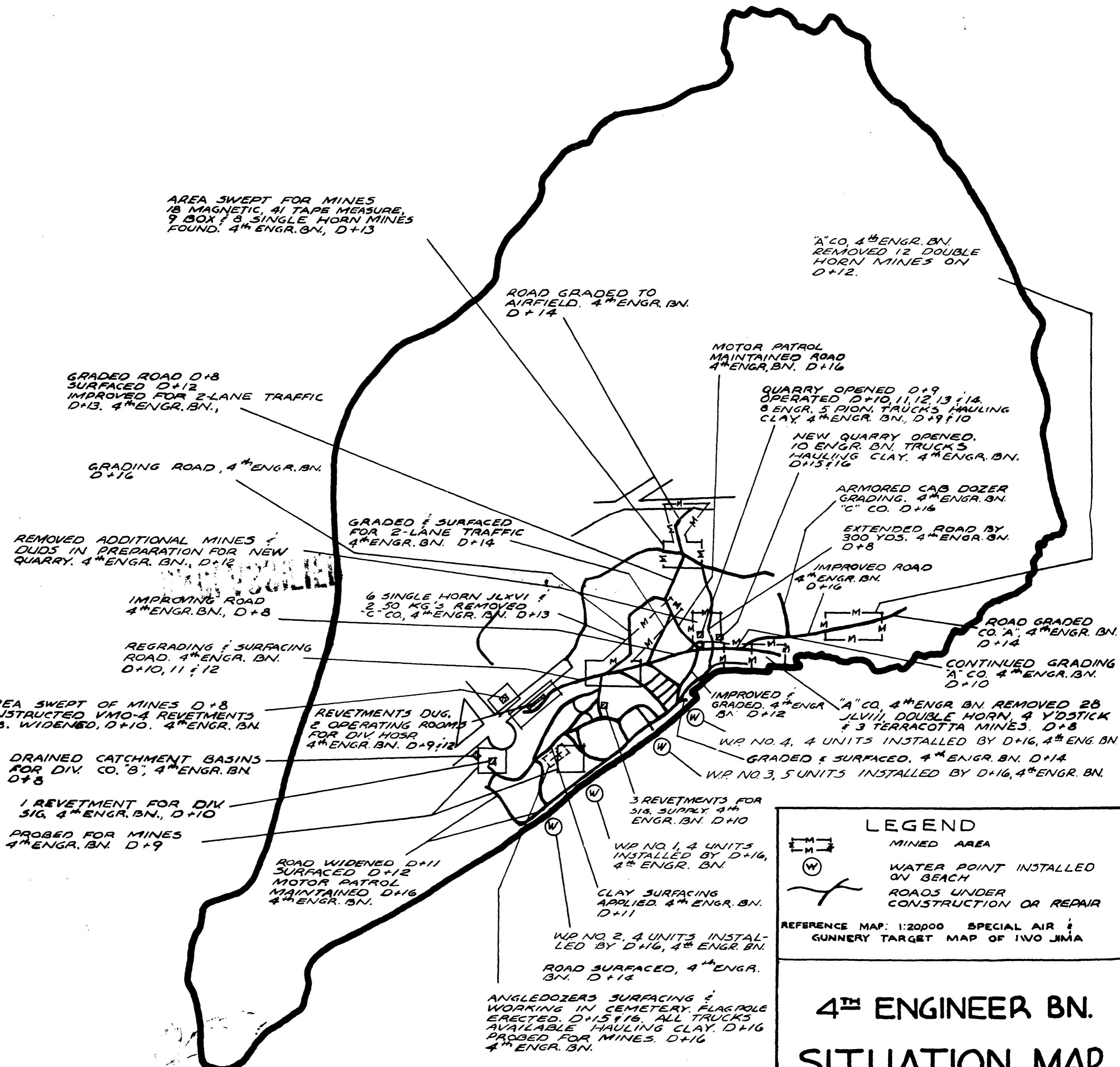
4TH ENGINEER BN.
SITUATION MAP
NO. 1
FROM D-DAY TO 1600, D+7

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NOTE:

ALL ROAD SITES BOTH PROPOSED AND UNDER CONSTRUCTION HAVE BEEN PROBED FOR MINES.



4th ENGINEER BN.
SITUATION MAP
NO. 2

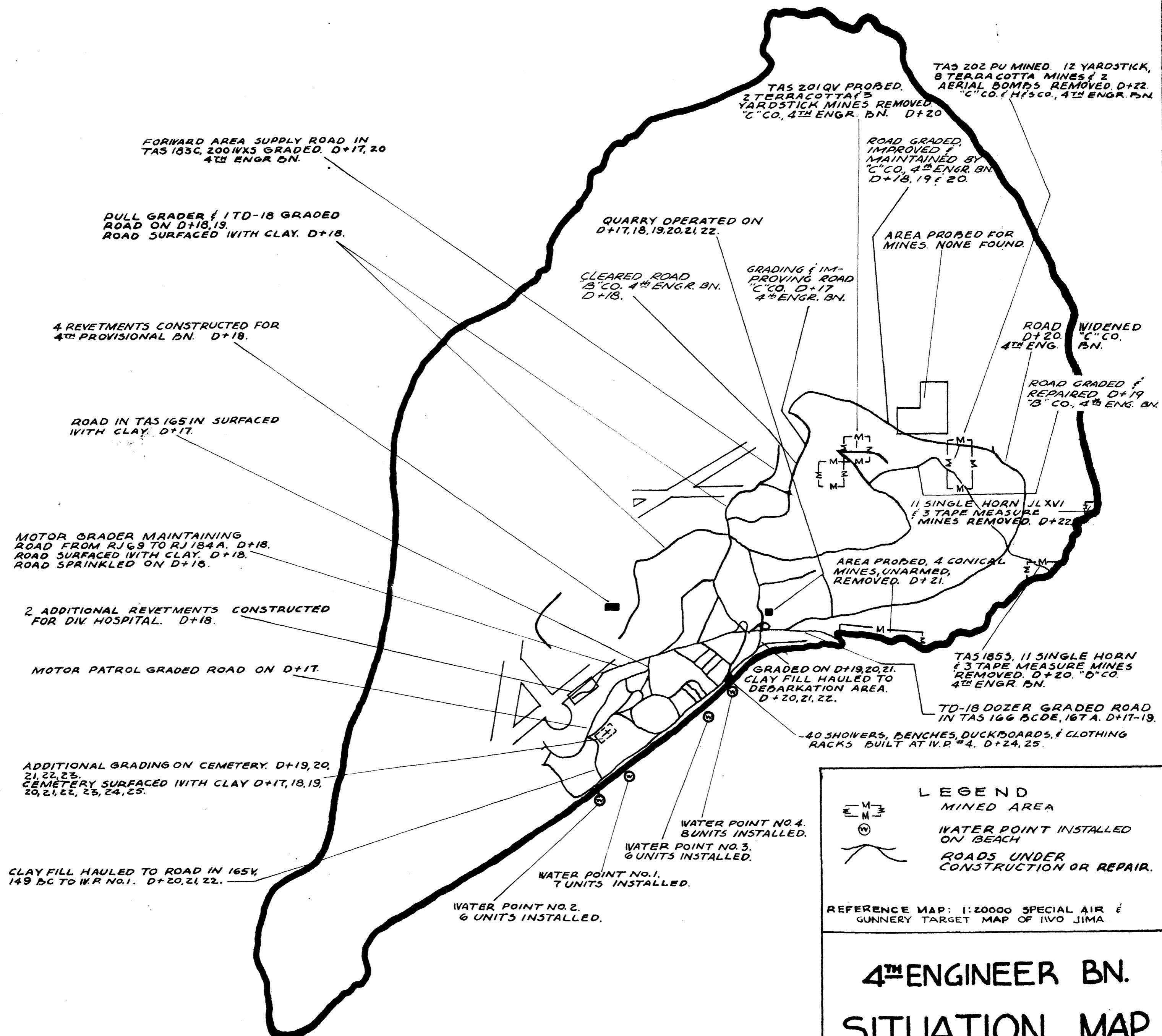
1600, D+7 TO 1600, D+16

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NOTES:

1. ALL ROAD SITES BOTH PROPOSED AND UNDER CONSTRUCTION HAVE BEEN PROBED FOR MINES.
2. ROADS MAINTAINED AND SPRINKLED IN DIVISION REAR AREA D+19, 20, 21 & 22.



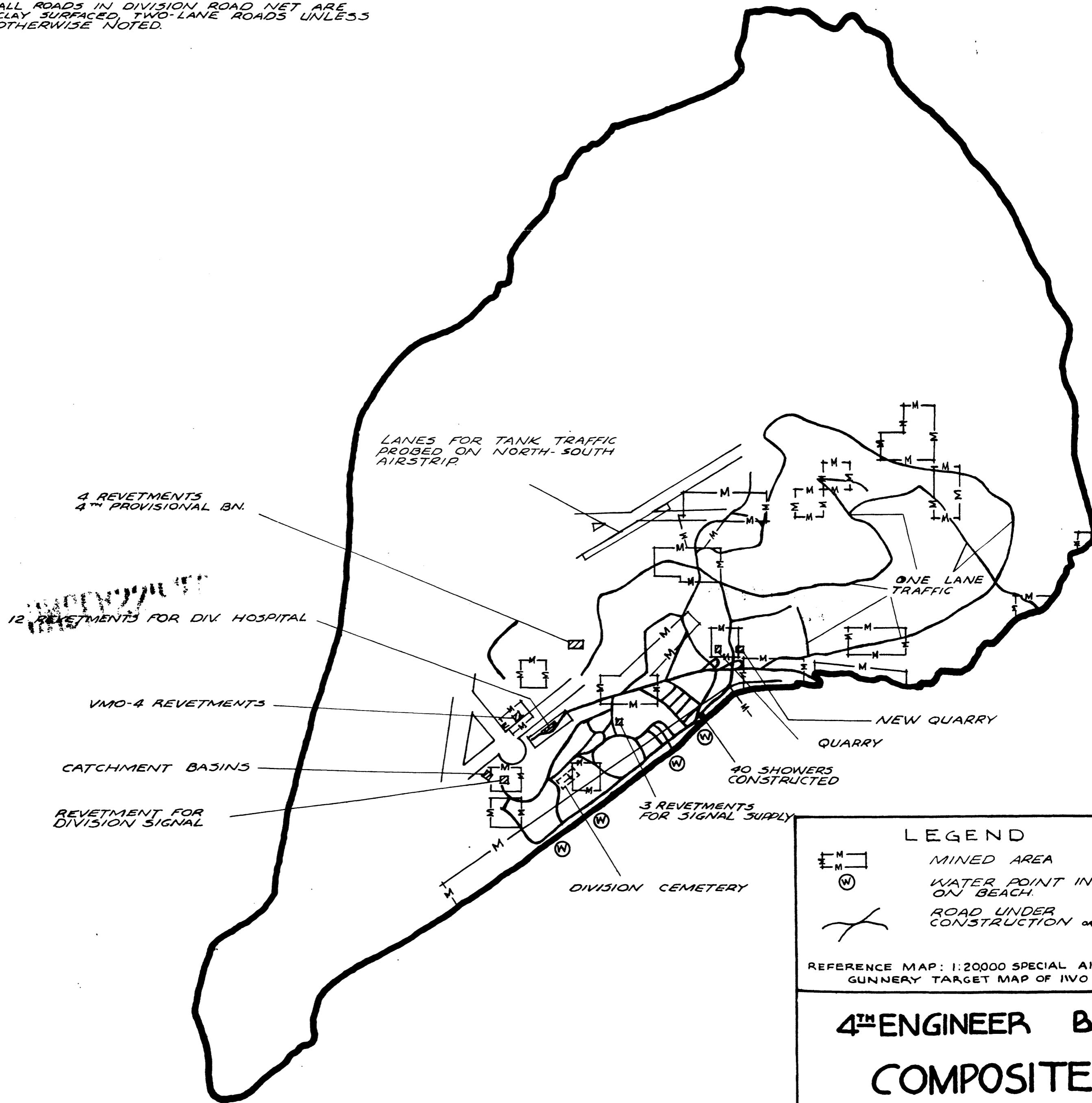
4th ENGINEER BN.
SITUATION MAP
NO. 3
1600, D+16 TO 1600, D+25

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NOTES:

1. ALL ROADS IN DIVISION ROAD NET WERE PROBED FOR MINES BY 4TH ENGR. BN. PRIOR TO CONSTRUCTION OR REPAIR.
2. ALL ROADS IN DIVISION ROAD NET ARE CLAY SURFACED, TWO-LANE ROADS UNLESS OTHERWISE NOTED.



**4TH ENGINEER BN.
COMPOSITE
SITUATION MAP
FROM D-DAY TO 1600, D+25**

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APPENDIX 2

MINE REMOVAL

*

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Fourth Engineer Battalion - Operation Report - IWO JIMA - (cont'd)

An increasing tendency of the Japanese to engage in mine warfare has been observed in reports of recent operations throughout the Pacific Ocean Areas. This trend was apparent in the Iwo Jima operation, where the Japanese displayed logical, tactical employment of mines. Although their efforts were fairly effective, the state of training of the enemy forces had not reached the stage where maximum efficiency was attained. In many instances mines were discovered emplaced but not activated; the frequency with which this occurred is attributed to incomplete training and casualties to key personnel.

Although no radically new types of mines were encountered, new methods of activation were observed. Two new type grenades made their appearance, and a shaped-charge anti-tank grenade was found in quantity. The following mines and grenades were found:

(1) Two-horn Hemispherical Mine, JLXIII.

Comment: Unfavorable beach and surf conditions apparently precluded the use of this mine as an anti-boat mine, but small fields were discovered about 100 yards inland for anti-tank use. On several occasions these mines were used for road blocks. See photograph No. 1.

(2) One-horn Conical Mine, JLXVI.

Comment: This mine designed for anti-tank and anti-mechanized defense was encountered throughout the Division Zone of Action. The majority however, were found on the beaches and their immediate vicinity. On the Yellow Beaches this mine was found buried in an inverted position without the chemical horn; it was activated by placing a yardstick mine across the base. On small beaches in the north-east sector of the island this type of mine was found partially buried inland from a low barbed wire entanglement. As many as five trip wires were connected between the mine's single horn and the barbed wire. See photograph No. 2.

(3) Aerial Bombs 50, 63 and 250 Kg - Buried as Mines.

Comment: All bombs discovered were of the Navy type. Contrary to previous enemy doctrine which called for

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Fourth Engineer Battalion - Operation Report - IWO JIMA - (cont'd)

bombs to be buried in a vertical position and armed with an A-3 type fuze, these bombs were buried horizontally without fuzes. Bombs were activated by placing a yardstick mine on top and in direct contact with the bomb. This procedure generally proved to be very effective. See drawing No. 1.

(4) Yardstick Mine.

Comment: This mine was widely used as a means of detonating heavier charges as previously mentioned, but it also appeared by itself in anti-tank and anti-mechanized mine belts and defenses. See photograph No. 3.

(5) Terracotta Mine.

Comment: According to Japanese instruction sheets this mine is to be used against vehicles and personnel. On Iwo Jima it was primarily employed as an anti-personnel weapon. It was found near emplacements and close to barbed wire entanglements either with or without a trip wire (cat-gut is used for trip wire, 30 yards being supplied with every 5 mines). See photograph No. 4.

(5a) Box Mine (Small).

Comment: This mine is an adaptation of the terracotta mine using the same fuze and explosive charge. See photograph No. 5.

(6) Tape Measure Mine.

Comment: Extensive use of this mine in the vicinity of emplacements and roads was noted. Both anti-personnel and anti-vehicular fuzes were used. The mines were scattered indiscriminately without regard to pattern. See photograph No. 6.

(7) Magnetic Anti-tank Grenade (Mine).

Comment: One or more of these was found on the person of enemy dead in the initial phases of the operation. It seems probable that this item is standard

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Fourth Engineer Battalion - Operation Report - IWO JIMA - (cont'd)

equipment for each soldier. In addition to its primary use it is exceptionally effective as a hand grenade. See photograph No. 7.

(8) Anti-Tank Grenade (Shaped-charge).

Comment: These grenades appeared for the first time in quantity. Two sizes were found which indicate that it is still in the experimental stage. Although each emplacement for infantry appeared to have a large quantity on hand, no instances of their use upon our tanks were reported in this Division's sector. Experiments conducted showed this grenade to be capable of penetrating our medium tank's armor. The test was made with a hand placed charge. See photograph No. 8.

(9) Terracotta Hand Grenade.

Comment: Reports indicate that this grenade is used for concussion effect, but it does not appear to be too effective. See photograph No. 9.

(10) Frangible Smoke Grenade, White.

Comment: This grenade contains a yellowish liquid, which, according to translations from the instructions on the shipping container, is of varying composition. The liquid composition is primarily titanium tetrachloride with varying amounts of silicon tetrachloride. See photograph No. 10.

(11) Improvised Box Mine.

Comment: Numerous mines were found in and around emplacements, but very few had been activated or emplaced. See photograph No. 11.

(12) Molotov Cocktails.

Comment: These were widely distributed but unused. In many instances whole cases were found unopened. One type is shown in the accompanying photographs.

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Fourth Engineer Battalion - Operation Report - IWO JIMA - (cont'd)

The liquid filling has a petroleum base with some thickener added, possible latex. See photograph No. 12.

(13) Miscellaneous Grenades and Prepared Explosive Charges.

Comment: See photograph No. 13.

Japanese policy, based on information gathered to date, does not appear to dictate a standard mine pattern. Definite trends and tendencies observed indicate that some doctrine is being formulated.

Beach mine defenses have taken on the most definite pattern and can be broken down into three zones or mine belts:

- a. Anti-boat defense zone: This mine belt is composed of two horn hemispherical mines usually placed off shore from the high water mark. Due to unfavorable surf conditions this was not borne out in this operation, but the doctrine has been well established in previous landings.
- b. Beach defense zone: Again as in previous operations the single horn conical mine was found on and in the immediate vicinity of the beaches. Two rows of these mines were found, rows about six paces apart with individual mines in the rows six paces apart and staggered to give a mine density of one mine for every three paces of front. Barbed wire may or may not be found to seaward of this belt. A typical section of this type is shown in drawing No. 2, attached.
- c. Inland defense zone: This zone inland from the beaches was composed of 250 Kg aerial bombs activated with yard-stick mines. Drawing No. 3 shows the pattern found about 150 yards inland from Blue Beaches, rows 1 and 2 continued on down through the Yellow Beaches. The Japanese had conveniently marked the location of each bomb with a small wooden stake that had never been removed.

After beach areas are passed mined areas can only be anticipated but not definitely predicted, and thereafter the mine pattern is indefinite. Areas in the vicinity of barbed wire (pattern indicated in Drawing No. 4) are likely to be mined with both anti-personnel and

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Fourth Engineer Battalion - Operation Report - IWO JIMA - (cont'd)

anti-personnel mines. Drawing No. 5 is a typical example of this type of field. Anti-personnel mines are to be expected in front of emplacements, but no pattern can be anticipated. Road shoulders were found to be mined in many instances but there seemed to be little or no regularity or pattern. A considerable number of nuisance mines were scattered over the entire island.

Although numerous booby traps were reported, no report of a booby trap actually being deactivated was received.

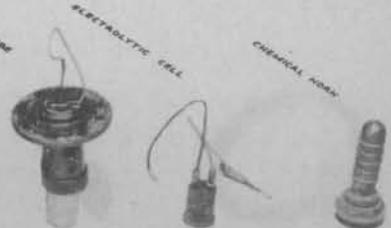
The mine removal procedure developed and practiced during the training period prior to the operation was employed by the Engineers during the operation. The S.O.P. on minefield and mine marking, as it applied to assault phases, was followed throughout the operation and proved to be of great value to all units engaged in this work.

Although each Engineer platoon had a magnetic mine detector (SCR-625) at its disposal, the high iron content of the soil on Iwo Jima made its use impractical. All buried mines discovered were the result of systematic probing with utility knives, bayonets or similar articles. Several non-metallic mine detectors (AN/PRS-1) were received just prior to embarkation, but insufficient time was available to properly train operators. Preliminary results obtained with the two units carried by Headquarters and Service Company were disappointing. Further tests will be conducted in rehabilitation area to determine usefulness of this detector.

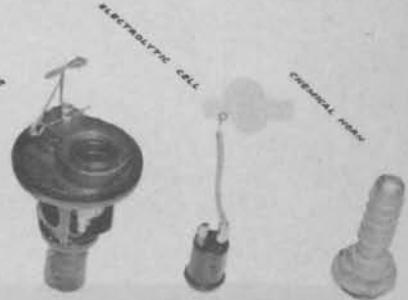
The assistance and cooperation of the Second Bomb Disposal Company in the removal and disposal of mines and bombs contributed greatly to the success of the entire mine removal project.

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JAPANESE TWO-HORN HEMISpherical MINE JL XIII.
HORIZONTAL SCALE 0 5 10 12 20 INCHES
PHOTOGRAPH NO. 1



JAPANESE SINGLE-HORN CONICAL MINE, JL XVI.
HORIZONTAL SCALE 0 3 6 9 12 15 INCHES
PHOTOGRAPH NO. 2

~~SECRET~~
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CASE

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EXPLOSIVE BLOCK



FUZE

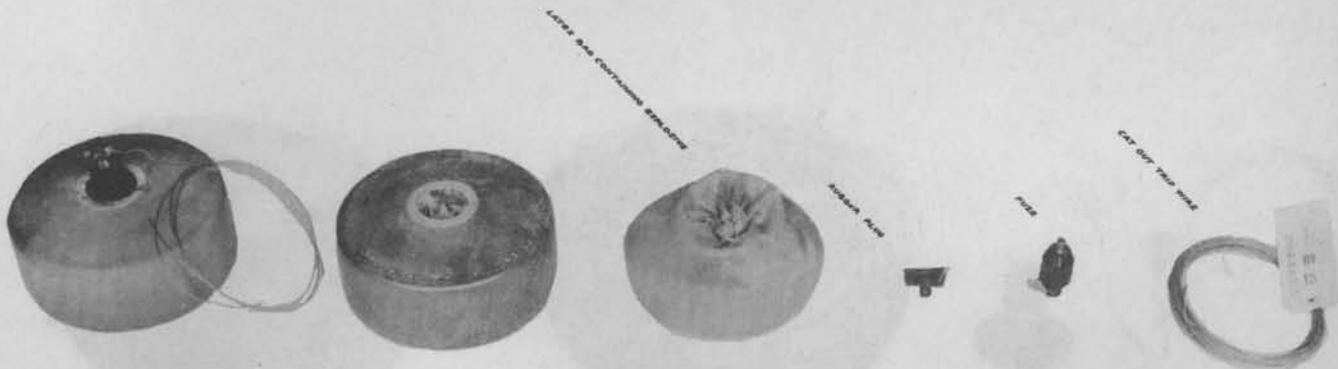


SAFETY PIN

JAPANESE YARDSTICK MINE.

HORIZONTAL SCALE 0 3 6 9 INCHES

PHOTOGRAPH NO. 3



JAPANESE TERRACOTTA MINE.

HORIZONTAL SCALE 0 2 4 6 8 10 INCHES

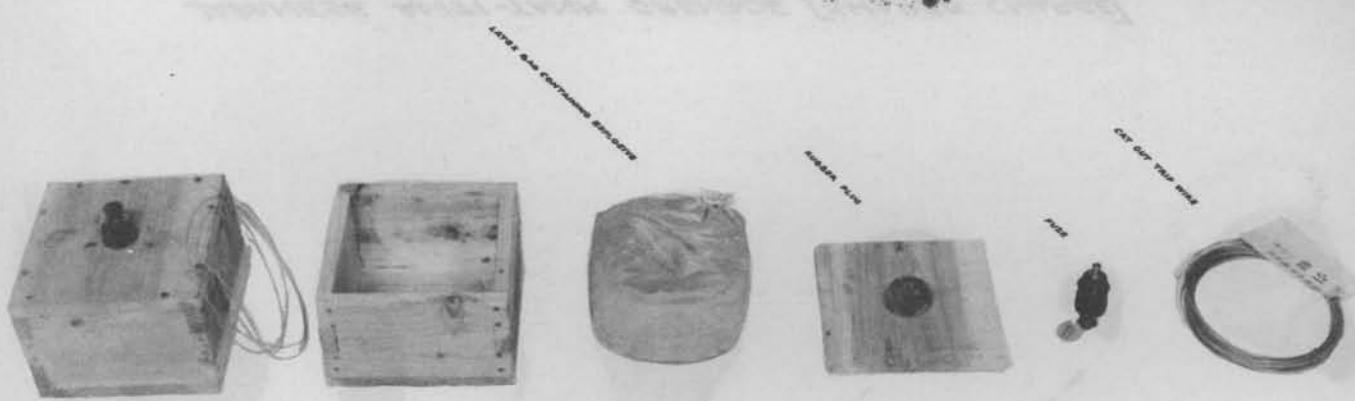
PHOTOGRAPH NO. 4

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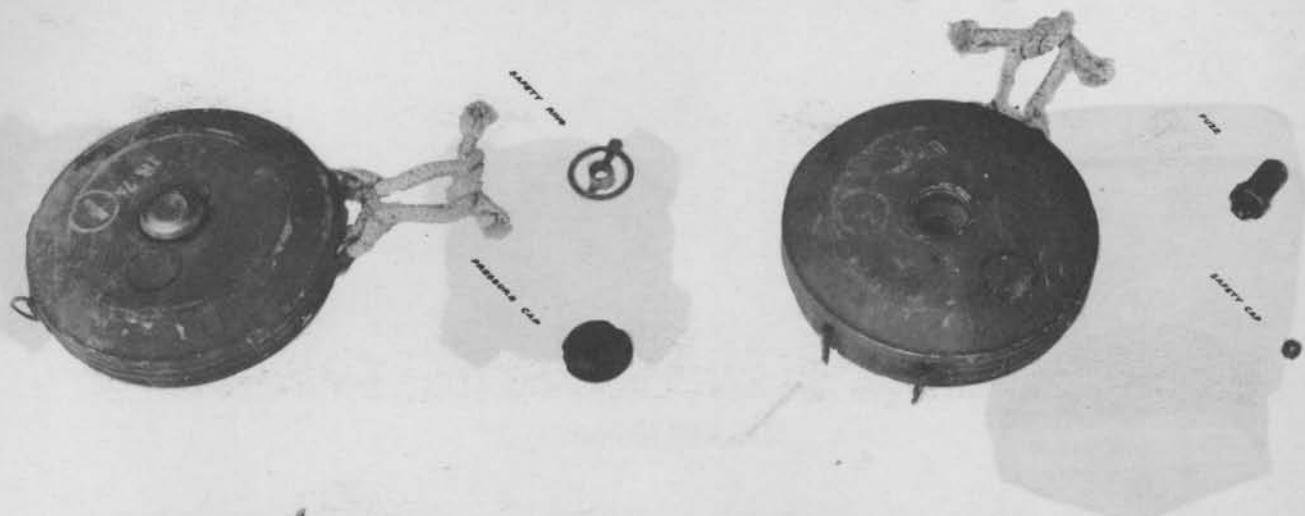
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JAPANESE BOX MINE. SMALL.
HORIZONTAL SCALE 0 1 2 3 4 5 6 INCHES
PHOTOGRAPH NO. 5

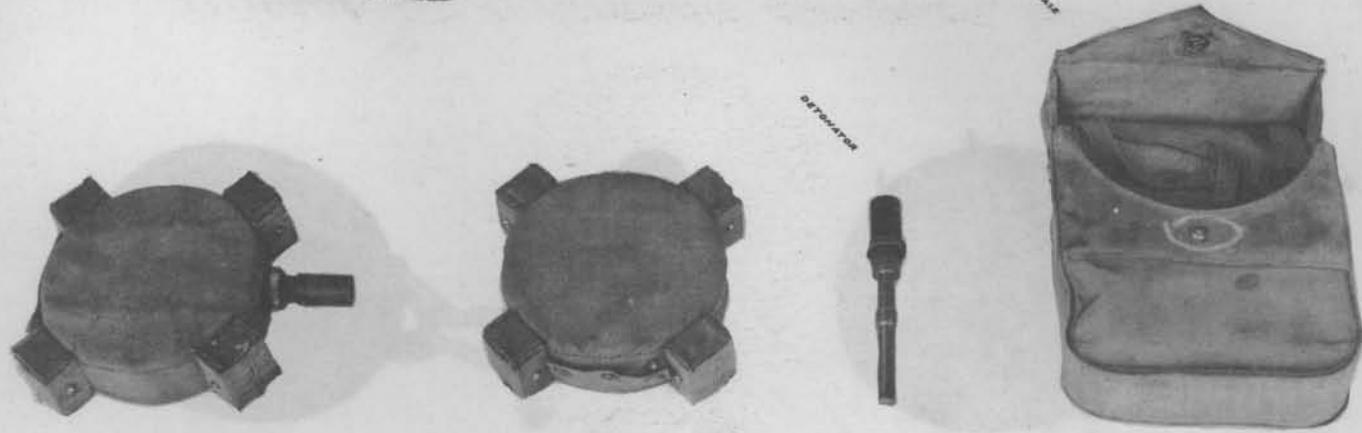


JAPANESE TAPE MEASURE MINE
HORIZONTAL SCALE: 0 1 2 3 4 5 IN.
PHOTOGRAPH NO. 6

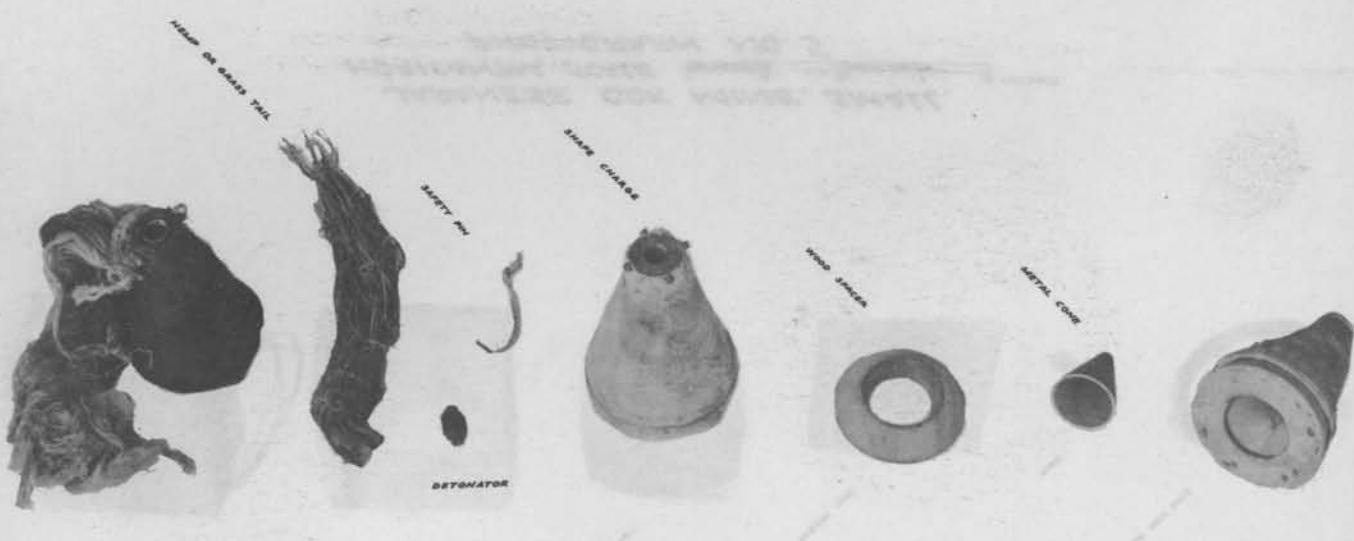
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JAPANESE ANTI-TANK GRENADE [MINE]
HORIZONTAL SCALE 0 1 2 3 4 INCHES
PHOTOGRAPH NO. 7



JAPANESE ANTI-TANK GRENADE [SHAPED CHARGE]
HORIZONTAL SCALE 0 1 2 3 4 5 IN.
PHOTOGRAPH NO. 8

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JAPANESE TERRACOTTA HAND GRENADE
HORIZONTAL SCALE: 0 1 2 3 INCHES
PHOTOGRAPH NO. 9

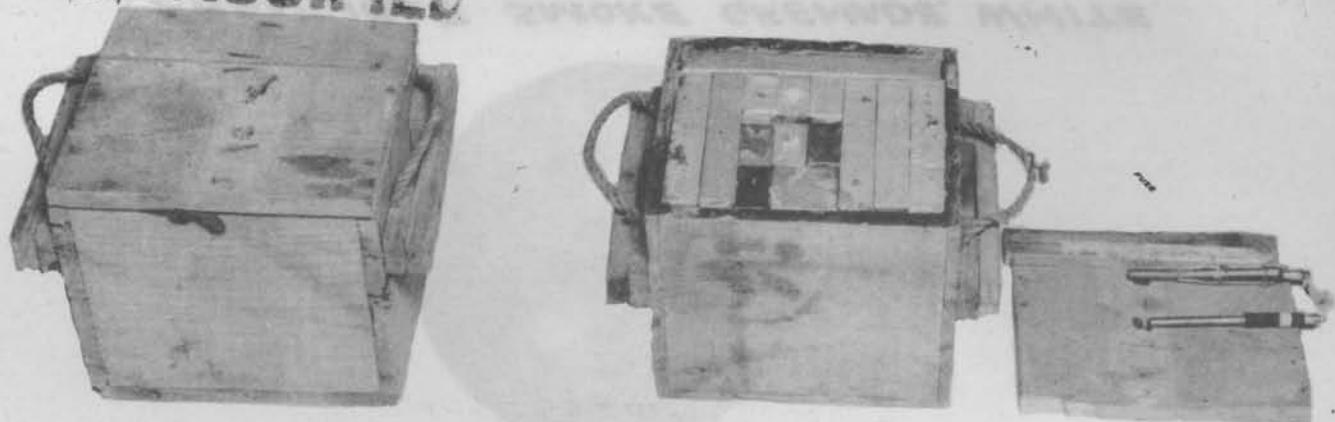
WOODEN CAP WITH MATCH COMPOUND

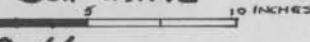


FRANGIBLE SMOKE GRENADE, WHITE
HORIZONTAL SCALE: 0 1 2 3 INCHES
PHOTOGRAPH NO. 10

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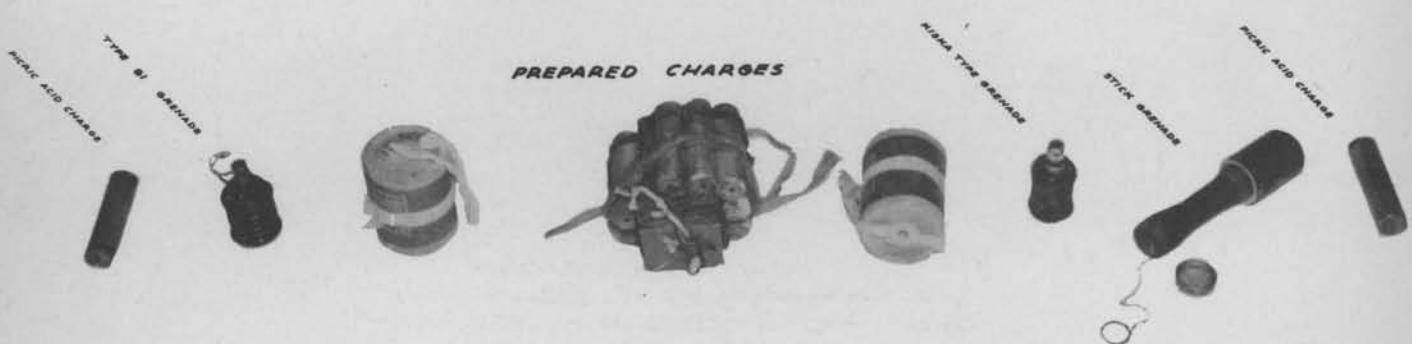
JAPANESE IMPROVISED BOX MINE
HORIZONTAL SCALE:  INCHES
PHOTOGRAPH NO. 11



JAPANESE MOLOTOV COCKTAIL
HORIZONTAL SCALE:  INCHES
PHOTOGRAPH NO. 12

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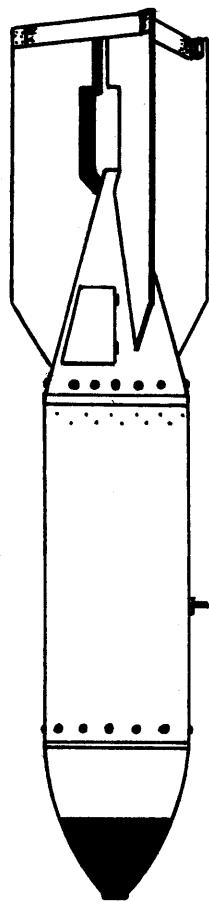
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MISCELLANEOUS GRENADES & EXPLOSIVES
HORIZONTAL SCALE: 0 1 2 3 INCHES
PHOTOGRAPH NO. 13

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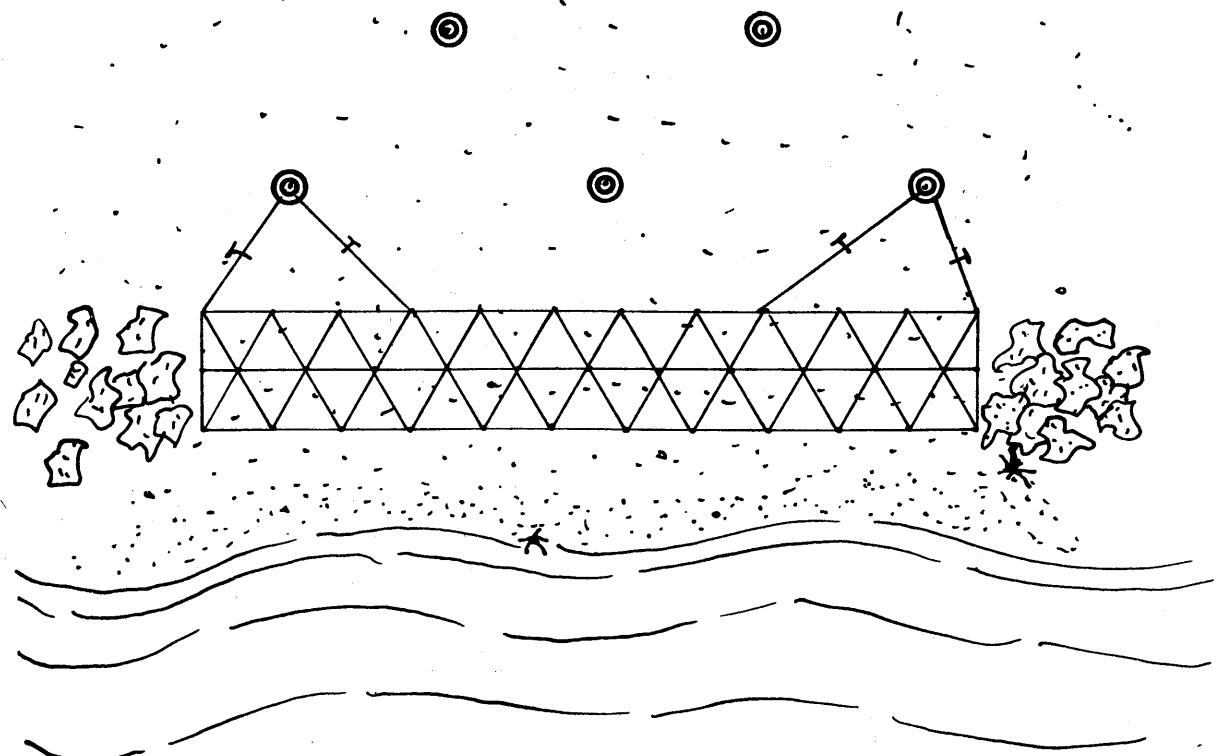


JAPANESE
250 KG. BOMB

DRAWING NO. 1

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LEGEND

- JL XVI SINGLE HORN MINE
SINGLE STRAND LOW BARBED
WIRE.
- TRIP WIRE CONNECTING HORN
ON MINE WITH BARBED WIRE.
ROCKS.
- BEACH AREA.

MINED BEACH AREA IN TAS 186A
REF. MAP: 1:20,000 SPECIAL AIR & GUNNERY MAP IWO JIMA
NO SCALE

DRAWING NO. 2

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TAS 165 T

N

- 250 KG AERIAL BOMB.
- YARDSTICK MINE.

MINE FIELD
CONTINUES
AT 30° AZ.

NOTES:

1. ORIGIN OF FIELD 120 YDS.
DIRECTLY INLAND FROM CENTER
OF BEACH BLUE 1 IN TA 165-T.

2. THIS SECTION OF FIELD EXTENDS
ALONG A 45° AZ. FOR A DISTANCE 120 YDS
FROM ORIGIN.

3. FIELD LAID IN 4 ROWS 12 YDS APART
WITH MINES IN EACH ROW 12 YDS APART.

4. EACH MINE CONSISTED OF 250 KG.
BOMB ACTIVATED WITH A YARDSTICK MINE.

5. AXIS (LONG) OF MINE WAS BURIED PARALLEL
TO AXIS OF FIELD.

6. ROWS 1 AND 2 ONLY EXTENDED THROUGH
YELLOW BEACHES.

SCALE: 1" = 20 YDS.

REFERENCE MAP: 1:20,000 SPECIAL AIR & GUNNERY MAP-IWO JIMA
DRAWING NO. 3

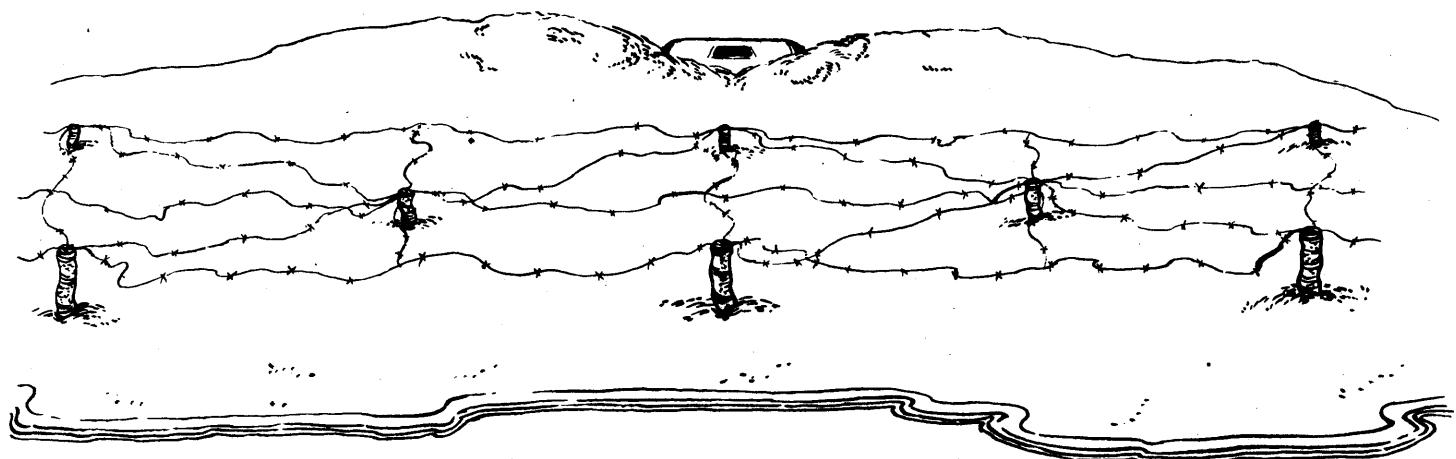
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TYPICAL JAPANESE WIRE SECTION

FOUND ON IWO JIMA

SINGLE STRAND BARBED WIRE STAPLED TO SMALL WOODEN POSTS 6" TO 12" ABOVE THE GROUND. THE POSTS ARE PLACED IN A TRIANGULAR PATTERN, EACH POST ABOUT 8' APART.

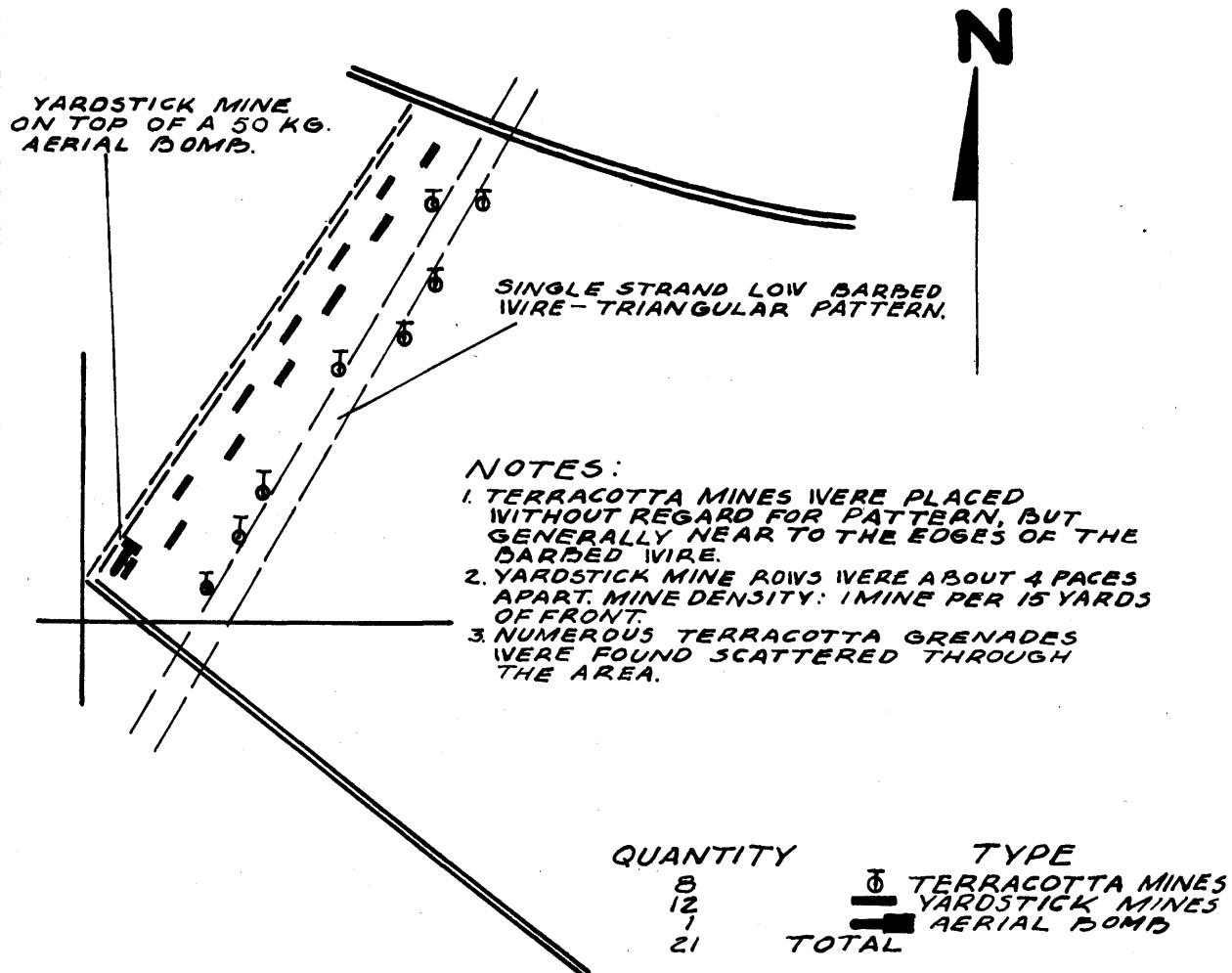


DRAWING NO. 4

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TAS 202P



DRAWING NO. 5

SCALE: NONE. REFERENCE MAP: 1:20000 SPECIAL AIR SURVEY 1944

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APPENDIX 3

WATER SUPPLY

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Fourteenth Engineer Battalion - Operation Report - IWO JIMA - (cont'd)

1. The following report of water production and operational difficulties experienced with various Badger Distillation Units together with general notes and observations of the water supply problem is herewith submitted. Only breakdowns or other malfunctions that caused one or more hours inoperation are recorded herein. Other shutdowns, caused by minor mechanical difficulties and quickly corrected in the field are deemed unimportant and therefore, not mentioned.

2. Nine distillation units were unloaded from an LSM on the beach at approximately 1600, D/5. Six of these units were set up in revetments during the course of D/6 and late in the same afternoon, water was being produced from four units. By noon of D/7, 3500 gallons had been produced of which approximately 500 gallons had been dispensed. As additional units were unloaded, they were set up and put into operation. During the period, D/7 through D/9, no accurate record of operation was attempted; however, it is estimated that a total of 30,000 to 35,000 gallons of water was produced and dispensed to all comers at the water points. On D/10 a delivery system was established whereby all water was hauled to the Division water dump for further distribution. An accounting system of water thus delivered was also set up at this time. Records were kept on a 24 hour basis, a consolidation of which is tabulated as follows: (See also graphical analysis of water production attached).

<u>DATE</u>	<u>WATER ON HAND</u>	<u>WATER ISSUED</u>
D/10	900 gal.	15,290 gal.
11	3400	14,220
12	8500	10,060
13	7645	18,155
14	5200	18,130
15	3500	20,670
16	4400	17,960
17	5700	15,675
18	4800	18,970
19	6575	19,490
20	3600	23,170
21	6250	23,260
22	10,200	25,805
23	9925	23,360
24	9000	23,690
25	8765	24,720
26	-	25,750
	T O T A L	338,375 gals.

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Fourth Engineer Battalion - Operation Report - IWO JIMA - (cont'd)

SUMMARY

Theoretical total capacity (1500 g.p.d./unit on beach) - 502,500 gal.
Recorded amount of water issued - period D/10 to D/26 - 338,375 "
Losses due to units being out of service - - 69,000 gal.
Other losses (errors in accounting, leakage,
seepage, spillage, pilferage, contaminated
distillate, etc. - - - - - 95,125

Total Operation Losses 164,125 gal.

Average number of units in daily operation - - - - - 18.5
Average quantity of water issued daily - - - - - 19,904 gal.
Average production per unit in daily operation - - - - - 1,075 "
Average efficiency per unit, daily - - - - - 72%

3. (a) UNIT MC #80380: This unit was started 25 February and operated approximately $\frac{1}{2}$ hour when the Morflex Coupling (installed at rest camp) failed. The Pottstown Compressor on this unit was quite noisy and the engine seemed to be laboring. A Crocker-Wheeler rubber ball coupling was substituted but the balls failed after approximately $\frac{1}{2}$ hour. New balls were installed after which the unit was again started. Quieter operation was noted and no further trouble was experienced until 11 March when the float valve in engine water cooler failed to function. At this time it was noted that engine rpms were lessening. Valve and carbon job on engine necessary. Float was found to have come loose due to vibration. Unit put into operation after about 9 hours. Shut down again on 16 March due to need of cleaning tubes which job was not accomplished as the water point was secured.

(b) UNIT MC #50254: This unit was started 25 February and operated approximately 12 hours when the Morflex Coupling (factory installed) failed. This unit was equipped with a Sutorbuilt compressor and ran very quietly and smoothly. Rubber ball coupling installed after which no further trouble was experienced. Time out of service approximately 3 hours.

(c) UNIT MC #50253: This unit started 25 February and operated approximately 15 hours when the Morflex Coupling failed. Another Morflex Coupling from a unit not in operation

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Fourth Engineer Battalion - Operation Report - TWO JIMA - (cont'd)

was substituted after which no further trouble was experienced. Time out of service approximately 5 hours. On 16 March this unit was shut down to clean tubes which job was accomplished in about 10 hours. Unit ready for further operation but water point was secured at this time.

- (d) UNIT MC #80727: This unit ran perfectly for 5 days. During a routine shutdown for lubrication the engine seized for no apparent reason. Engine completely overhauled and unit put back into service after about 8 hours. On 15 March this unit was shut down to clean tubes and engine which job was accomplished in about 10 hours. Unit ready for further operation but water point secured at this time.
- (e) UNIT MC #90536: This unit was noticeably noisy a short time after being started up on 7 March. On 11 March, MTSgt Pollock investigated source of noise and found broken half-tooth on drive gear of Sutorbuilt compressor with mating half-tooth on driven gear cracked. Secured the unit as unserviceable. This is a new machine and had never been tampered with or adjusted by this battalion.
- (f) UNIT MC #59943: This unit is one of the six given us in place of six units surveyed at rest camp. All indications are that it is a "rebuilt" job. Is equipped with Pottstown compressor. Was put into operation on evening of 11 March. Chest pressure failed to reach normal level and erratic operation was experienced. Distillate was produced but constant attention of operator was necessary. "Trouble shooting" was started next morning and continued until 15 March when a defective gasket on the inlet end of the heat exchanger was found. According to the operation manual, this end of the heat exchanger need not be tampered with unless a complete overhaul is desired. Defective gasket replaced and unit put into operation with excellent results.
- (g) UNIT MC #80728: This unit out of service about 24 hours to install new shaft and bearing on brine pump and to clean engine. Pulley on shaft worked loose and wore down shaft so that further tightening of set screw was ineffective. Engine water pump had developed a leak and was replaced at this time.

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Fourth Engineer Battalion - Operation Report - IWO JIMA - (cont'd)

- (h) UNIT MC #59982: This unit out of service about 24 hours to clean engine and to replace leaking engine water pump.
- (i) UNIT MC #80518: This unit out of service about 24 hours to clean engine.
- (j) UNIT MC #80504: This unit out of service about 12 hours to clean tubes. High chest pressure and erratic operation were symptoms that such work was necessary. Unit had run very satisfactorily and continuously for 14 days.
- (k) UNIT MC #80541: This unit shut down for about 10 hours to clean tubes.
- (l) UNIT MC #59979: This unit secured on 14 March due to compressor coupling trouble. Key had moved along shaft and finally wore the keyway so large that it became useless to do more work on the coupling. This trouble was detected on 12 March but attempts to correct same were not permanent.
- (m) UNIT MC #58052: Unit shut down for about 8 hours to clean engine.
- (n) UNIT MC #80534: Unit out of service approximately 12 hours to clean engine and re-sweat leaking connection on exhaust heat exchanger.
- (o) UNIT MC #59935: Unit out of service approximately 4 hours to clean engine.
- (p) UNIT MC #50252: The unit operated very satisfactorily but distillate production was only 50% normal (est). This trouble is diagnosed as poor compressor efficiency as is evidenced by sub-normal chest pressure. A replacement unit or new compressor is indicated.

4. General observations of past performance and recommendations for future operations follow:

- (a) All engines became inefficient after about 300 hours operation. This seems to be caused by fouling in the combustion chamber due to high lead content of the gasoline used. Lower octane gasoline would alleviate this

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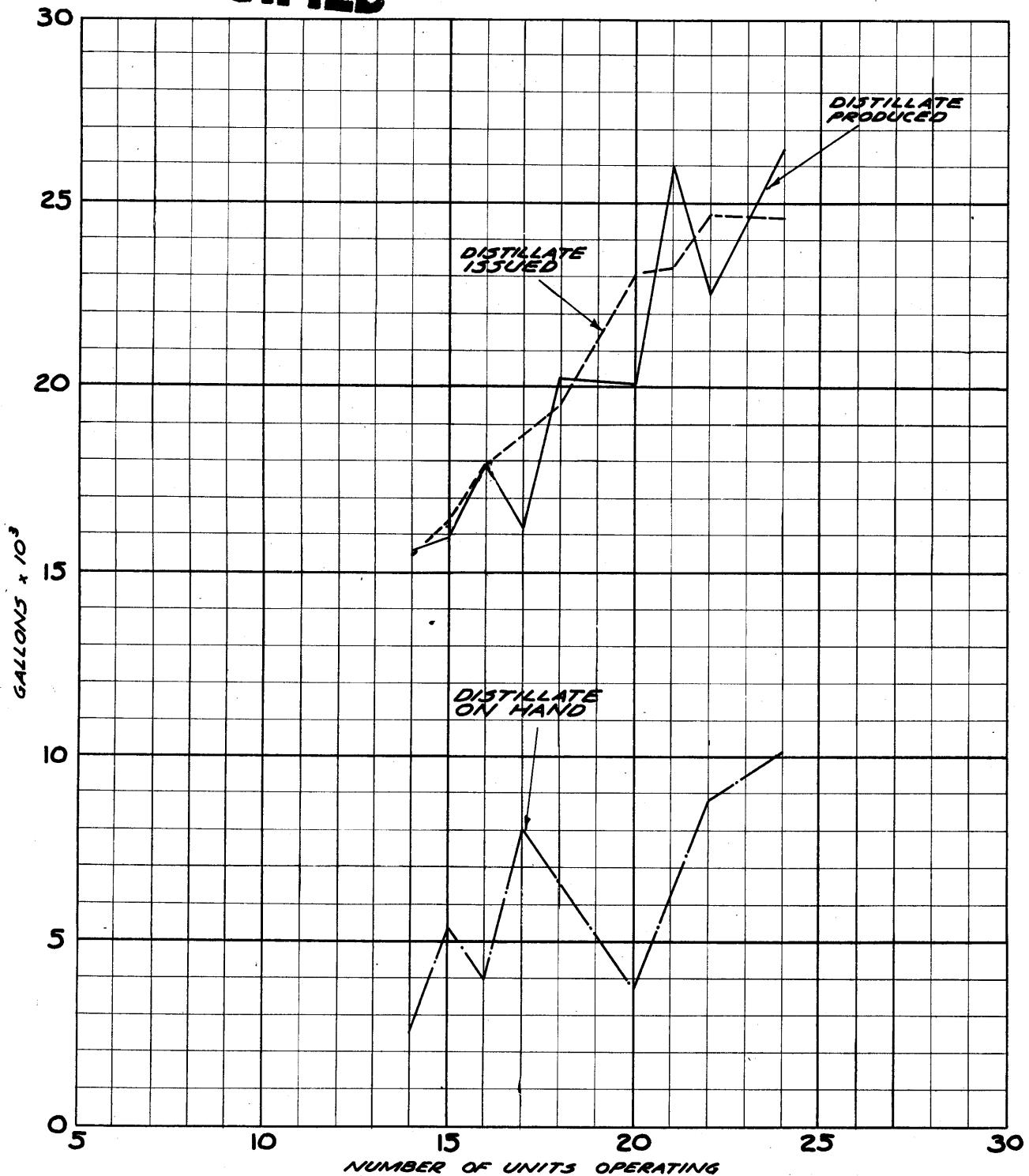
Fourth Engineer Battalion - Operation Report - IWO JIMA - (cont'd)

trouble. It should be remembered that these engines operate at about 220 degrees F. as compared to 160-180 degrees in the ordinary truck engine using the same 80 octane gasoline. Furthermore, manufacturer's specifications as to capacity and general overall efficiency are based on 65-70 octane gasoline. An approximate efficiency ratio of gasoline to water is 1:65 for planning requirement in fuel.

- (b) The present method of determining quantity of water dispensed is somewhat erroneous, i.e., for every four (4) five gallon cans delivered, credit is given for 20 gallons of water, whereas 21 gallons is actually received. In other words, the cans hold one quart more than nominal capacity when filled to overflowing which is usual practice.
- (c) Although no analysis was made, it was evident that the sea water in the immediate vicinity of Iwo Jima is unusually high in mineral content. This is borne out by the fact that all distillation units "scaled-up" after about 400 hours operation and in much shorter time if the sea water (at source) was warm. Apparent absence of usual marine life around the shore line, such as crabs, small fish, barnacles and even sea-weed might be considered further evidence of this high mineral content.
- (d) Inasmuch as quick scaling and inefficient operation of distillation units was experienced at Water Point No.4 when warm sea water was inadvertently used as a source, and at other water points on the island when hot brine was used, it is suggested that the E.M. Badger Co. be asked to recommend maximum sea water temperature consistent with efficient operation of their machines; such data to be published in a technical bulletin together with the caution that water known to be highly mineralized (whether hot or cold) should be avoided if possible.

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PRODUCTION ANALYSIS of BADGER DISTILLATION PLANT
IWO JIMA OPERATIONS
4TH ENGR BN, 4TH MARINE DIVISION

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SHEET 1

APPENDIX 4

ROAD CONSTRUCTION

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Fourth Engineer Battalion - Operation Report - IWO JIMA - (cont'd)

I. RECONNAISSANCE PHASE.

Continuous reconnaissance throughout the Division area was necessary to keep road construction and maintenance abreast of traffic requirements.

All existing Jap roads were characteristically poor and would require rebuilding wherever used.

Inland from the beach the terrain sloped up at approximately a 20% grade to Motoyama Airfields #1 and #2. The entire area is overlaid with a deep deposit of volcanic ash which is incapable of sustaining heavy traffic. However, the material has very good drainage properties and is well graded.

The quarry located in target squares 183W, X, was found to contain an unlimited deposit of sand clay. Visual inspection of the material indicated that it had good binding quality and particle size distribution. Further investigation indicated that it was the same material used by the Japs to sub-surface the local airfields, although they had used very little of it for road surfacing.

It was evident on D+6 that the existing system was inadequate. Beach and dump traffic moved slowly and with great effort through the loose ash. Congestion was universal. Roads were too few and too narrow. Additional beach matting required to provide traction was not available and tracked vehicles were damaging the matting already in place.

II. ESTIMATE OF THE SITUATION.

Efficient movement of traffic throughout the Division zone made a planned two lane road net system imperative; road construction to start immediately in the Division beach area and progress forward to the vicinity of battalion CP's as permitted by the tactical situation. All roads to be two lane (20 ft.-minimum width) surfaced construction and maintained.

To accomplish the above in the most expeditious manner, the following schedule of operations was inaugurated. Priority of work as indicated:

1. Opening and operating quarry.
2. Construct lateral beach road connecting Division dump and beaches; TA 165X,W.R.Q.V; 1484,E.

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Fourth Engineer Battalion - Operation Report - IWO JIMA - (cont'd)

3. Improving and surfacing existing beach and dump roads. TA 165J,O,S,T,W,X.
4. Construct new short cut roads in dump areas. TA 165I,N,S,W.
5. Improve and surface road from Division Hospital to quarry. TA 165K to CR 58.
6. Improve and surface road from CR 58 to CR 249.
7. Construct new road from RJ 184 to intersect with road passing through TA 165J.
8. Improve and surface road from CR 249 to RJ 273 to Motoyama Airfield #2 (TA 183B).
9. Improve and surface road from CR 249 to CR 263 to Motoyama Airfield #1 (TA 165C).
10. Improve and surface road from CR 58 to Bemb Disposal Dump (TA 167A).
11. Improve and surface road from RJ 69 to Water Point #4 (TA 166H).
12. Improve and surface road along south and west side of Motoyama Airfield #2 (TA 183B,C,D; 200Y,T.).
13. Improve and surface roads in Division dump area (TA 148H,I,J).
14. Improve and surface road from water point #1, TA to road junction in TA 165.
15. Construct dump access road for Provisional Battalion (TA 182R).
16. Construct access roads to embarkation area (TA 165A to 165K).

III. CONSTRUCTION DETAILS.

During the period D/7 through D/24 approximately six miles of surfaced roads were constructed in the Fourth Division zone. The proximity of high grade natural materials made simplified, speedy construction methods appropriate.

Although the volcanic ash had no lateral stability unless confined, it was ideal subgrade material where grade could be obtained without embankments. By careful planning only minor local cuts and fills were found necessary to secure satisfactory stability and alignment. TD-18 angle-dozers were used exclusively for this work with excellent results.

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Fourth Division Battalion - Operation Report - IWO JIMA - (cont'd)

The sand-clay surfacing in its natural state was deposited on the sub-grade from dump trucks. TD-18 angle-dozers spread the material in a single layer 3" to 6" thick. After a few hours of traffic compaction, graders shaped the surface. Particle distribution, moisture content and cohesion of the natural material were such that a good stable traction surface was obtained without mechanical stabilization or additional water. Heavy traffic and moderate rainfalls of two to three hours' duration had no deteriorating effect during the time the roads were under observation.

Maintenance requirements were moderate, one motor grader patrolled the roads daily shaping the surface and filling holes where necessary. Medium tanks and amphtracs caused most of the surface defects. Continuous sprinkling with salt water prevented dusting and raveling. This work was accomplished by two improvised 2000-gallon trailers.

Enemy mines were a constant threat on sub-grade construction. All possible precautions were taken and many mines were removed by探ers working ahead of the equipment. No casualties, disabled equipment or appreciable lost time resulted from mines encountered on the roadwork described in this report.

Quarrying operations were started on D+9 with the following equipment: One 3/8 yard shovel, one TD-9 shovel loader, one TD-18 dozer and ten 2½T dump trucks. Average daily production with this combination was approximately 400 loads or 1200 cubic yards.

There were several quarry sites in the same vicinity which had been opened by the Japs. The one chosen initially had the advantage of shorter haul and was favored by the tactical situation at this time. It had been worked extensively and very little preparation was necessary. There was one drawback in that the face was much too high for safe close-up operation. Benching by blasting and dozers proved impractical and when operation became dangerous the site was abandoned. However, several thousand loads of material were obtained from the floor and lower face before this became necessary.

The original reason for opening the quarry was to obtain surfacing for roads in the Fourth Division area but it was soon supplying material for the airfield work and various other projects throughout the Fifth Amphibious Corps area. The original light equipment was replaced by a 1½ yard shovel and a 3/4 yard shovel to take care of the increased demand.

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Fourth Engineer Battalion - Operation Report - IWO JIMA - (cont'd)

One of the nearby sites was selected to provide material for the remaining work in the Fourth Division area. As in the previous case, extensive operations by the Japs had resulted in a very high face. The amount of material for estimated requirements did not warrant the use of benching methods. It was decided to work the floor and lower face again. The amount of preparation required to place the site in operation was negligible and quarrying operations were started on D+17 with the following equipment: Three TD-9 shovel loaders, one TD-18 angle-dozer, one ripper w/TD-18 utility tractor prime mover and ten $2\frac{1}{2}$ T dump trucks.

The material was so highly consolidated that the light shovel loaders did not have enough power to cut through it. The ripper and angle-dozer were able to keep a good stockpile of loose material ahead of the shovel loaders. When the project was in full swing daily production average was 300 to 350 loads.

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1.	Total length of road constructed (min 20' width)	10,560 yds.
2.	Total square yards road constructed.	73,920
3.	Total cubic yards road surfacing material.	9,000
4.	Total man hours on road construction	1,250
5.	Total angledozer hours road construction	170
6.	Total grader hours on road construction.	45
7.	Total truck hours on road construction	850
8.	Square yards of road constructed per man hour.	59
9.	" " " " " dozer	350
10.	" " " " " grader.	350
11.	" " " " " truck	87
12.	Total grader hours on road maintenance	134
13.	" man " " " "	408
14.	" gals. water " " " "	64,000
15.	Square yards of road maintained per man hour	184
16.	" " " " " grader hour.	551
17.	Gallons of water per square yard road maintenance.9
18.	Total yardage quarried	11,000
19.	Total man hours on quarry operation.	380
20.	" equipment hours on quarry operation.	240
21.	" truck " " " "	1,300
22.	Yardage quarried per man hour.	30
23.	" " " equipment hour.	46
24.	" " " truck hour.	8.4

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SECTION V

COMMENTS AND RECOMMENDATIONS

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Fourth Engineer Battalion - Operation Report - IWO JIMA - (cont'd)

1. COMMENT: The heavy angledozer tractor with armored cab again proved its worth in this operation for pioneer road building in areas subject to sniper and sporadic mortar fire. For this operation, the number of armored cabs (3) carried by this battalion was adequate. Visibility from the present cab is poor. Excessive heat is developed inside the cab due to the lack of insulation between cab interior and the engine. The interior of the cab for the TD-14 tractor with angledozer is too confined to permit the operator easy manipulation of the controls.

RECOMMENDATION: Suggestions for improving the present armored cab will be submitted as a separate letter.

2. COMMENT: This operation demonstrated an urgent need for a heavily armored tracked vehicle to aid in the assault of fortifications requiring large explosive charges for demolition. The Army Engineer Armored Vehicle modified from the medium tank is capable of carrying large quantities of explosives to a selected target for demolition in spite of heavy enemy concentration of small arms and light mortar fire.

RECOMMENDATION: It is recommended that four (4) Engineer Armored Vehicles per division be procured for assignment to the Division Tank Battalion for operation by a tank-engineer team.

3. COMMENT: In the training period prior to the operation and in the preparation of operation plans much lithographic reproduction was done by this battalion in multiple copies requiring cutting. No means are provided in the Divisions for cutting paper stock except laborious trimming by hand.

RECOMMENDATION: It is urgently recommended that a paper cutter, hand operated, capable of handling the largest paper stock furnished the Engineer Battalion Reproduction Section be procured and issued on the basis of one (1) per Hq&Serv Company, Engineer Battalion, Marine Division.

4. COMMENT: It was once more forcibly impressed upon this battalion that the Browning Automatic Rifle and the bazooka, or rocket launcher, are indispensable in mopping-up operations against the

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Fourth Engineer Battalion - Operation Report - IWO JIMA - (cont'd)

Japanese. Mopping-up against the Japanese may include anything from a single wounded enemy soldier with a hand grenade to a well armed and equipped force which has successfully laid low until the main infantry force has passed by. Most mopping-up missions initially are squad tasks to permit complete coverage of extensive areas. The squad, therefore, should have the necessary mopping-up weapons.

RECOMMENDATION: (1) Browning Automatic Rifles should be allowed the Engineer Battalion, Marine Division, on the basis of one (1) per engineer squad, total of twenty-seven (27) for Engineer Battalion. (2) It is further recommended that the allowance of rocket launchers, AT, 2.36 inch, M1A1, for the Engineer Battalion be increased to one (1) per engineer squad or a total of twenty-seven (27) per Engineer Battalion.

5. COMMENT: The clearance of passages for tanks manually through enemy minefields while under fire is extremely costly in personnel. Mine removal engineers must operate in an exposed position. They cannot use the mine detector while under fire since it is designed to be operated by a man in an upright position.

RECOMMENDATION: It is recommended that the "demolition snake" be procured and issued to the Marine Division for future operations in an effort to decrease the cost in personnel of breaching passages through enemy fire-covered minefields.

6. COMMENT: On this operation the five allowed TBX radios were used to good advantage. Two TBX's were held at Battalion Headquarters, one of which operated on the Division Logistic Net and the other was used on the battalion net. Each Company Headquarters had one set and was in communication at all times with the battalion. Ship to shore communication worked satisfactorily and in the early days of the operation this kept Battalion Headquarters informed as to the situation ashore. Through this means, the battalion was informed of the fact that one company had lost all but one officer by D/2 and the battalion adjutant was sent ashore as replacement Company Commander immediately. With the present allowance of radios, however, the platoon leaders have no communication with the Engineer Company Commander or with the Landing Team Commander. With this

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Engineer Battalion - Operation Report IWO JIMA (cont'd)

condition in mind, it is deemed advisable to equip the platoons and the Company Commander with SCR-300 radios. The Engineer Armored Vehicle should be equipped with SCR-508 radios to provide communication with the tanks of the Tank Battalion. In order to provide communication between the Armored Vehicles and the Engineer Company Commander in the sector in which the vehicles are operating, it is desired to equip the Engineer Battalion with an SCR-510 radio, with $\frac{1}{4}$ ton 4x4 truck. The present number of wire men is satisfactory, however, with the additional requested radio equipment, additional communication personnel will be required.

RECOMMENDATION: It is recommended that the following personnel and main items of radio equipment be allowed an Engineer Battalion:

<u>EQUIPMENT</u>	<u>PERSONNEL REQUIRED</u>	<u>REMARKS</u>
5 TBX radios	10	Used on Iwo Jima with excellent results.
1 SCR-510 w/ $\frac{1}{4}$ ton 4x4		Liaison set
15 SCR-300	15	For use of platoons and companies (1 per Plt, 2 per CoHq)
	3	NCO's
Wire equipment	12	Linemen and operators
	1	Communication officer
Total	<u>42</u>	

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ANNEX "ABLE"

ADMINISTRATION

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Fourth Engineer Battalion - Operation Report - IWO JIMA - (cont'd)

1. The initial distribution of the personnel of the Fourth Engineer Battalion for the operation is shown in the attached Disposition of Personnel chart which indicates that the lettered engineer companies operated under normal CT attachments. Headquarters and Service Company was retained under Division control through Support Group command.
2. By noon of D-Day the engineer platoons of "A" and "C" companies, attached to their respective landing teams, were ashore; the majority of the personnel in the Headquarters Platoons of both companies were also ashore, having left small detachments on board ship to handle equipment that had not yet been unloaded. On the evening of D-Day, Company "B" was ashore. Headquarters and Service Company landed on the morning of D+5 and by D+8 all detachments that were left aboard ship initially to unload equipment had landed.
3. Total casualties suffered by this battalion during the operation were 12 officers and 207 enlisted. The loss of trained specialist personnel is shown in the chart containing the breakdown of casualties by specification serial number. Inspection of the casualty graphs reveals that "A" and "C" companies sustained their heaviest losses on D-Day, and Company "B", landing with the reserve CT on D+1, also began to suffer heavy initial losses soon after it had established itself ashore. These severe losses in the early stages of the operation are in accord with the experience of all units landing on the first two days on Fourth Division beaches.
4. With the lettered engineer companies attached to combat teams, this battalion headquarters was responsible for the operation and administration of Headquarters and Service Company only. The lettered engineer companies, which were required to submit daily strength and casualty reports to their combat teams, also submitted these reports to the Fourth Engineer Battalion Headquarters.
5. The morale in this battalion remained high throughout the operation, which fact is attributable to efficient handling by experienced company officers, employment in most instances on those specialized missions for which they had been trained, and prompt and abundant mail deliveries.

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DISPOSITION OF PERSONNEL OF ENGINEER BATTALION
ON DIVISION SHIPPING

CT 23 SHIPPING	CT 24 SHIPPING	CT 25 SHIPPING
<u>APA-196 ("C" Co. HqPl)</u> 3 off. 31 enl.	<u>APA-33 ("B" Co. HqPl)</u> 3 off. 17 enl.	<u>APA-120 ("A" Co. Hq&2dPl)</u> 3 off. 73 enl.
<u>APA-158 ("C" Co. 1stPl)</u> 1 off. 41 enl.	<u>APA-118 ("B" Co. 1stPl)</u> 1 off. 43 enl.	<u>APA-157 ("A" Co. 1stPl)</u> 1 off. 43 enl.
<u>APA-207 ("C" Co. 2ndPl)</u> 1 off. 41 enl.	<u>APA-156 ("B" Co. 2ndPl)</u> 1 off. 48 enl.	<u>LST-684 ("A" Co. 3rdPl)</u> 12 enl.
<u>APA-154 ("C" Co. 3rdPl)</u> 1 off. 42 enl.	<u>APA-206 ("B" Co. 3rdPl)</u> 2 off. 45 enl.	<u>LST-731 ("A" Co. 3rdPl)</u> 1 off. 26 enl.
<u>APA-196 (H&S Co)-10 enl.</u> (Water Supply Squad)	<u>AK-65 ("B" Co. HqPl)</u> 4 enl. <u>APA-33 (H&S Co)-11 enl.</u> (Water Supply Squad)	<u>APA-157 (H&S Co.)</u> 14 off. 172 enl. <u>AKA-65 (H&S Co.)</u> 4 off. 51 enl. <u>AKA-21 (H&S Co.)</u> 5 enl. <u>APA-120 (H&S Co)-10 enl.</u> (Water Supply Squad)

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IWO JIMA OPERATION CASUALTY FIGURES.

4TH ENGINEER BATTALION,
4TH MARINE DIVISION, FMF.

Beginning strength; Officers 36 Enlisted 695.

UNIT	CASUALTIES											
	Killed		Wounded (Ev)		Sick (Ev)		Wounded (Non Ev)		Missing		TOTAL	
	Off	Enl	Off	Enl	Off	Enl	Off	Enl	Off	Enl	Off	Enl
H & S Co			1			4			4		6	
Co "A"	1	14	3	54			7		1		4	76
Co "B"	1	12	3	43			4		3		4	62
Co "C"	10	3	37			6	1		1		4	54
TOTAL	2	37	9	138			21	1	10			

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BREAKDOWN OF CASUALTIES BY SPECIFICATION SERIAL NUMBER

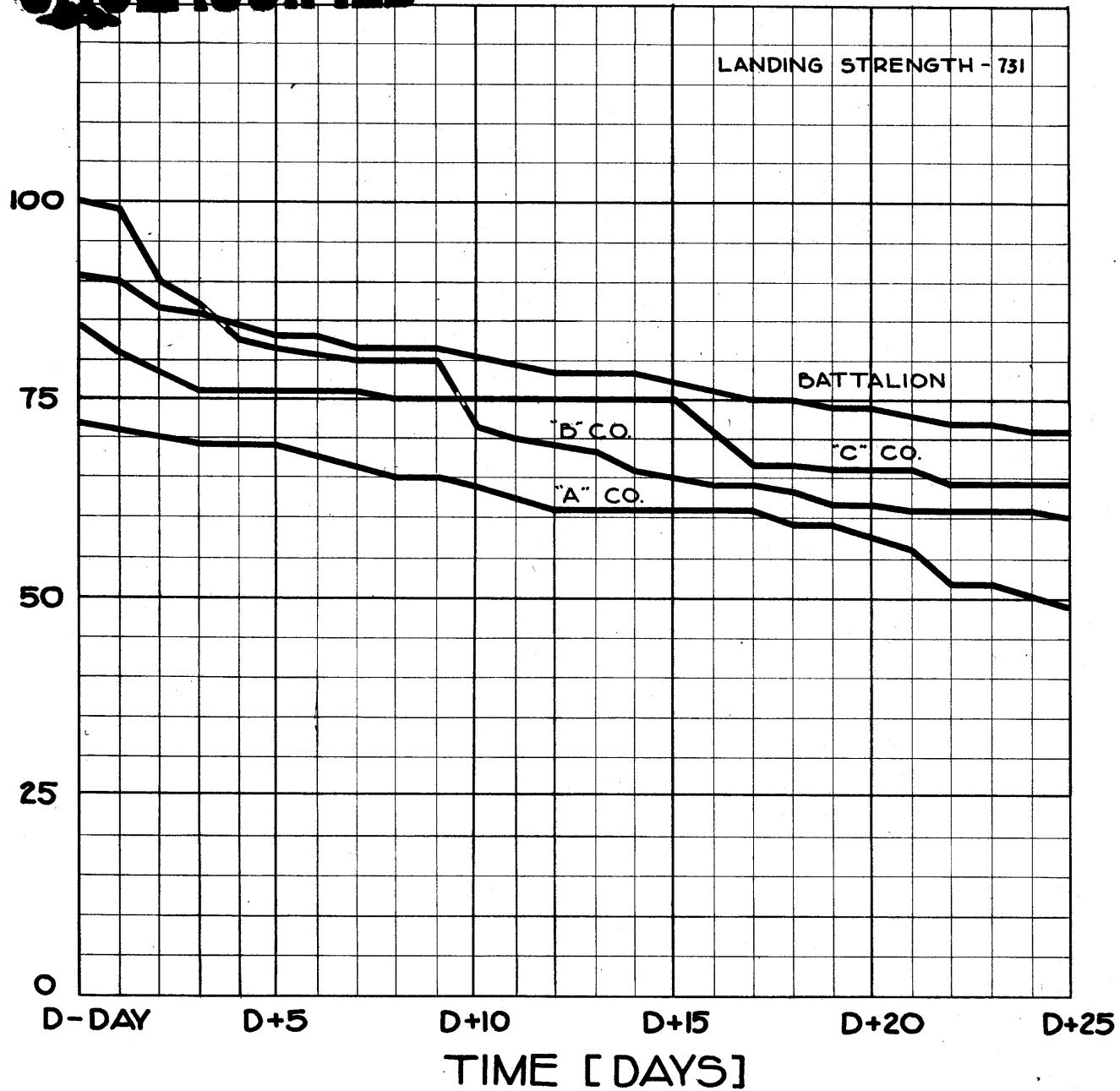
<u>SSN</u>	<u>TITLE</u>	<u>H&SrvCo</u>	<u>Co "A"</u>	<u>Co "B"</u>	<u>Co "C"</u>	<u>T-O-T-A-L</u>										
		T/O ACT	CAS	T/O ACT	CAS	T/O ACT	CAS	T/O ACT	CAS	T/O ACT	CAS					
1331	Engineer Officer	4	3	5	6	4	5	7	4	5	6	4	19	22	12	
013	Diesel Mechanic			1	1	1	1	1	1	1	1	1	1	1		
024	Blacksmith	1	3	1	3	1	1	1	1	1	1	4	7	2		
035	Carpenter, Bridge	9	7	15	3	2	15	10	2	15	12	8	54	32	12	
050	Carpenter, Gen'l	13	6	1	18	15	14	18	17	4	18	13	5	67	51	24
059	Const Foreman	4	3	3	5	3	3	4	4	3	4	3	4	13	16	7
060	Cook	7	8	5	3	5	4	1	5	5	1	22	20	2		
078	Electrician	4	2	4	12	6	4	4	2	4	2	16	20	8		
164	Plumber	2	2	1	2	1	1	1	1	1	1	5	5	1		
174	Radio Repairman	1	1	1	1	1	1	1	1	1	1	2	2	1		
189	Rigger	6	2	13	8	6	13	7	5	13	10	2	45	27	13	
206	Projectionist	1	1	3	2	3	3	3	4	3	4	2	14	9	5	
227	Surveyor	12	2	3	2	1	1	1	1	1	1	12	6	3		
242	Toolroom Keeper	5	2	3	2	3	3	3	4	3	4	2	1	1	1	
256	Welder	3	2									3	3	1		
316	Automobile Serviceman	2	2									2	2	2		
319	Engr Equip Mech	8	12	7	2	1	7	9	1	7	3	29	26	2		
322	Refrigeration Mech	6	3					1	1	2	2	6	6	1		
345	Truck Driver, Light	1	3	5	3	1	5	5	2	1	16	8	2			
359	Engr Equip Oper	14	28	4	25	22	7	25	7	25	13	6	89	70	20	
405	Clerk-Typist	6	3	2						1	6	4	4	2		
410	Dispatcher	1	1									1	1	1		
521	Other duties	1	1									2	2	2		
533	Demolition Spec.	4	4	30	30	14	30	35	18	30	32	15	94	101	47	
600	MG NCO			3	5	3	2	1	3	2	9	9	4			
604	Light MG crew			1	12	5	2	12	8	2	12	9	1	36	23	5
705	Basic Engr	13	3	9	9	3	9	6	3	9	4	2	40	22	8	
727	Water Supply	5	25	7	5	7	7	3	7	3	1	26	36	1		
796	Const Crew Chief	5	2	12	5	1	12	4	3	12	10	2	41	21	6	
803	Field Music	2		1		1	1	1	1	1	1	.1	5	2	1	
870	Cml NCO	2	1	1	1	1	1	1	1	1	1	5	2	1		
890	Photo-Interpreter	1	1	2	2					1	1	1	4	3		
929	Auto Equip Oper	28	12	13	11	2	13	15	4	13	8	1	67	46	10	
	Navy Corpman			1		3						4	8	8		
	TOTALS			16		80			65		58		219			

NOTE: T/O--Authorized allowance, ACT-- Actual strength, CAS-- Casualties.

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% EFFECTIVE STRENGTH DUE TO CASUALTIES

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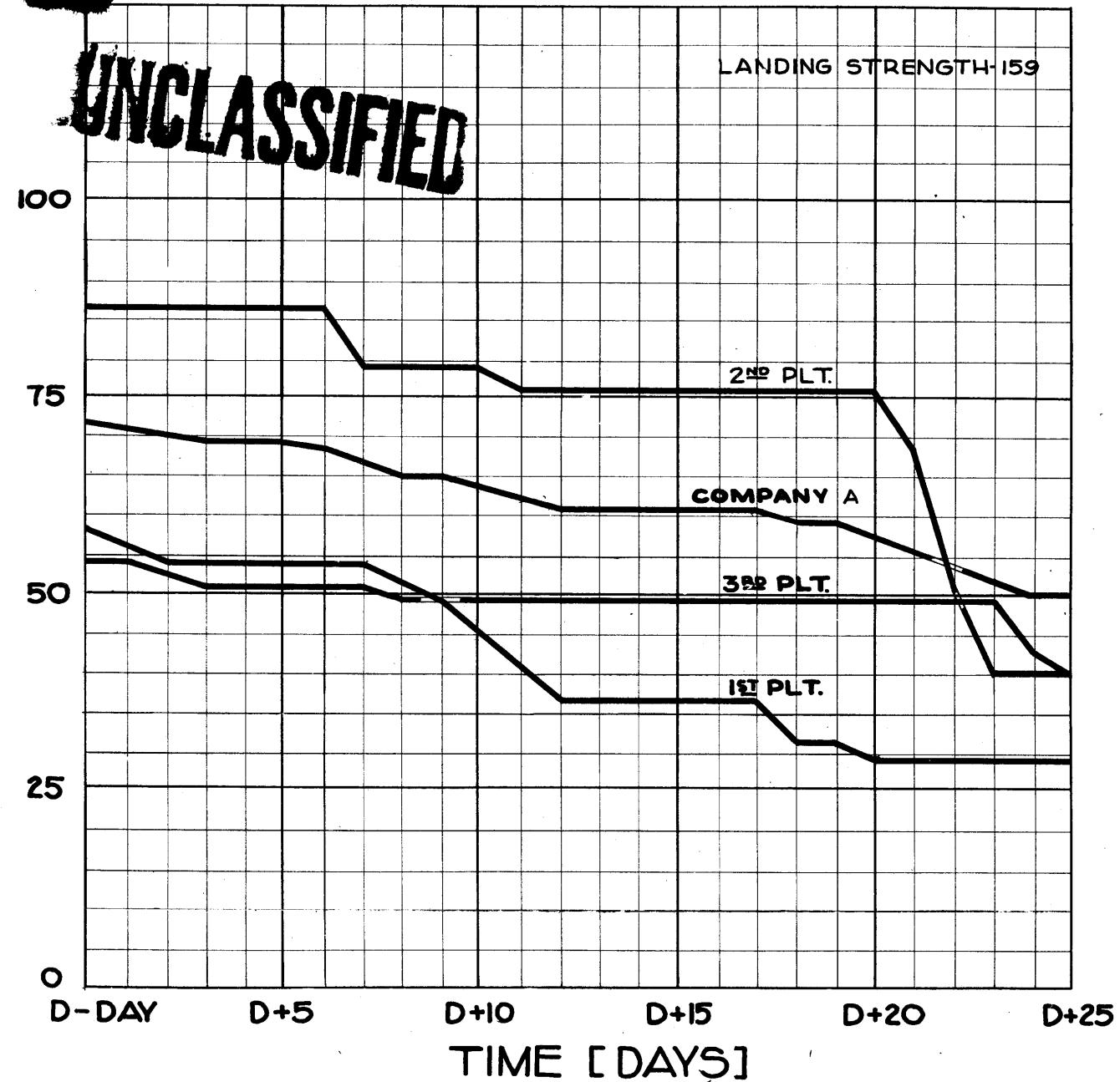


CASUALTY GRAPH

BATTALION

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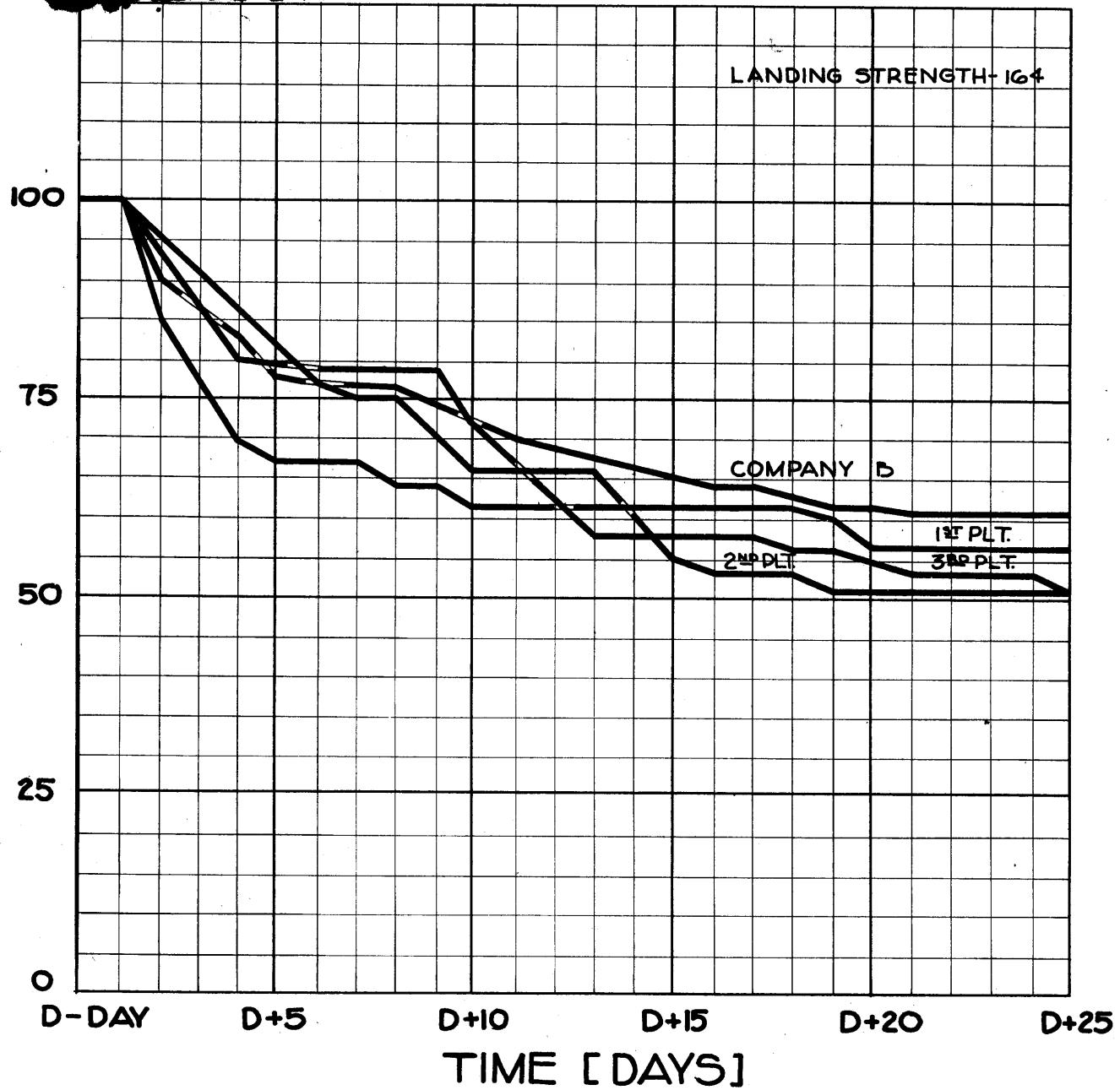
% EFFECTIVE STRENGTH DUE TO CASUALTIES



CASUALTY GRAPH
COMPANY A **UNCLASSIFIED**

~~REF ID: A64674~~
UNCLASSIFIED

% EFFECTIVE STRENGTH DUE TO CASUALTIES

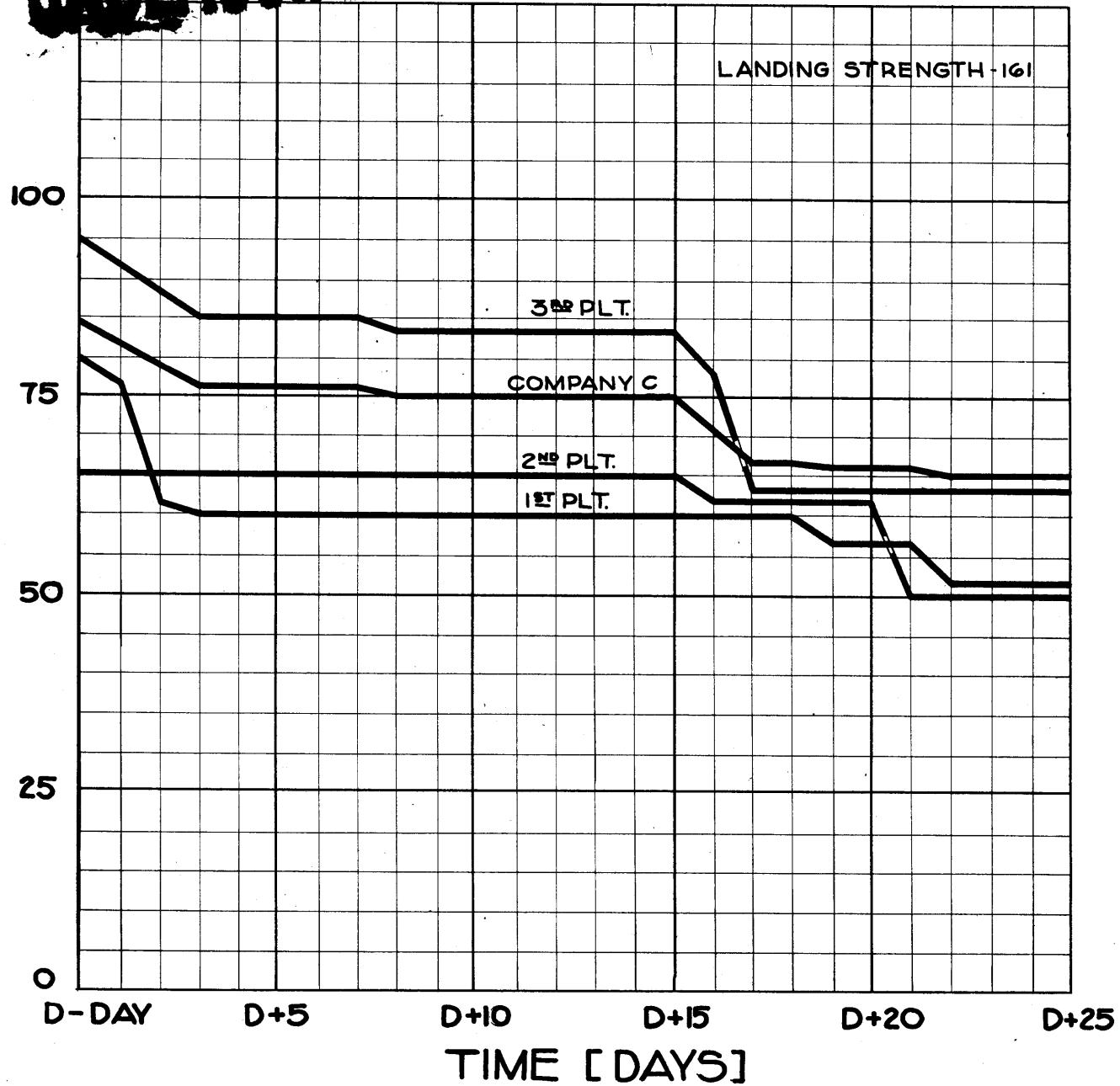


CASUALTY GRAPH
COMPANY B **UNCLASSIFIED**

% EFFECTIVE STRENGTH DUE TO CASUALTIES

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LANDING STRENGTH - 161



CASUALTY GRAPH

COMPANY C UNCLASSIFIED

*
ANNEX "BAKER"

' INTELLIGENCE

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Fourth Engineer Battalion - Operation Report - IWO JIMA - (cont'd)

I. ENGINEER INTELLIGENCE.

The information of engineering value, obtained from aerial photographs and maps before D-Day, was as accurate as possible considering the small scale of the photographs and the difficult conditions under which they were taken. The camouflage recommendations determined from colored aerial film were accurate, but camouflage painting of vehicles and some camouflage net garnishing did not conform to the "mouse-gray" coloring of the terrain in the beach area. Camouflage discipline was generally satisfactory in the Divisional Zone considering the number of troops and activities in the area.

The few Japanese roads within the Division Zone proved, as expected, to be inadequate to handle the Divisional traffic.

The quarry located in TAS 183X was opened and exploited by this battalion and provided sufficient borrow material for surfacing of Division roads, the 3rd and 4th Division cemeteries, extension of airfield runways and the reembarkation staging area.

Aerial photographs showed numerous wells within the Division Zone; those tested were too brackish for drinking but safe for washing. It was reported that in TAS 182R the Japs had a large distillation plant but investigation by an Engineer officer showed the plant to be a water pumping station. The Japs' principal source of fresh water appeared to be rainwater drained from airfields into concrete catchment basins.

The lumber supply on the island was practically nil. Except for a few large pieces of heavy timber found in eastern boat basin, the Division supply of lumber for construction purposes was transported to the island.

Engineer reconnaissance in the forward areas was done by the engineer companies attached to the Regimental Combat Teams. In the rear areas, the reconnaissance of roads, possible water points, mined areas and mine fields, was made by Headquarters and Service Company.

II. MAPS AND PHOTOGRAPHS.

The supply of maps and photographs was adequate. Due to the fact that the 1/5000 TA map (64th Topographic Battalion) was merely an

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Fourth Engineer Battalion - Operation Report - IWO JIMA - (cont'd)

enlargement of the 1/10000 map, it showed no more detail than the 1/10000 map. The other maps supplied this Division were as accurate as possible considering the high altitude at which the photographs were taken, the tip and tilt of the photographs and the small overlap between flights. The combat teams had no vertical aerial photographic coverage after D-Day. Aerial color film emphasizes detail more than ordinary film but no color film sorties were made available to the Division.

III. MINES AND MINE FIELDS.

See Appendix 2 to Section IV.

IV. RECOMMENDATIONS.

It is recommended that the enlarged 1/5000 TA map (64th Topographic Bn) be eliminated in the future. During an operation frequent vertical aerial photographic missions should be flown. These photos should be developed and printed and distributed to the combat teams for detailed study of the terrain to their front.

Colored aerial film strips (verticals) should be supplied to relief mappers and mappers to further enhance the value obtained from maps and models having the correct terrain color.

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ANNEX "CHARLIE"

OPERATIONS

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Fourth Engineer Battalion - Operation Report - IWO JIMA - (cont'd)

GENERAL

This operation proved to be the first of its type for this Division wherein the Engineer Battalion Headquarters was able to function strictly as engineers, without the numerous additional duties resulting from being engrossed in the functions of the Shore Party. It is believed that this most recent method of employment is an absolutely sound one in that it permits the utilization of Hq&Serv Company and a Battalion Headquarters for engineering in the Divisional rear area. Excellent supply roads, numerous beach egress roads, satisfactory rear area construction projects, proper supervision over utility requirements, and vital assistance, where needed, to support the combat team attached companies were all possible and within the capabilities of this company due to the narrow Division zone of action. Close contact with the engineer letter companies was maintained throughout the operation to attempt to foresee their requirements and to assist them in any way possible.

CONSTRUCTION SECTION

All job assignments, such as the building of the Division Hospital operating rooms or the construction of showers, were received by Battalion Headquarters and turned over to the Construction Officer for action. Due to the fact that sufficient lumber was available to this section for construction purposes, there was in no case any delay from the time of receipt of the mission to the time the work was started.

WATER SUPPLY SQUADS

These squads, being a part of the Equipment and Utilities Section, operated under the Officer-in-Charge of that section. The functioning of this unit was considered satisfactory, thus maintaining their high standard of efficiency as shown on Saipan and Tinian. They installed, repaired, maintained and operated all the units required to supply the Division with a sufficient quantity of distilled water. No purified water was used on this operation since no fresh water sources were located, although eight portable units were on hand to exploit any likely sources.

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Fourth Engineer Battalion - Operation Report - TWO JIMA (cont'd)

It is believed that the Hq&Serv Company four squad water section composed of all the water men in the battalion is a very satisfactory arrangement since all operations are combined under one head. The dispersion resulting from temporarily attaching one squad to each letter company for transportation purposes to the target has worked satisfactorily on the past two operations. The water section allowance of 7 men per letter company and 6 men from Hq&Serv Company has been supplemented by approximately 50 additional men taken from other sections in the company, however, this does not appear satisfactory since it is expected that on large operations these extra men would not be available.

EQUIPMENT AND UTILITY SECTION

In addition to supervising the water section as described above, all Hq&Serv Company engineer equipment is placed under the control of this section. Data covering hours of operation and on preventative maintenance was recorded for all equipment. The assignment of operators and reliefs for same during long operating hours was capably controlled by this section.

DEMOLITION SECTION

Although not legally recognized in the T/O as a bonafide section under the control of the Demolition Officer, a group of 10 men were trained during the training period in mine removal and advanced engineer demolitions. Duty with this section in most cases was additional to their regular duties and on a volunteer basis. This section was used to remove minefields located in rear areas, to assist and supplement letter companies when required, and to accompany each piece of Hq&Serv Company equipment when operating to eliminate the possibility of visible mines being detonated by the equipment. This section, although small in number was invaluable to this battalion throughout the operation.

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MOTOR TRANSPORT SECTION

The excellent cooperation of this section with all other sections in providing prompt and efficient transportation greatly speeded up all work in which this battalion was involved. Truck requests, in general, were made directly to the Motor Transport Officer who complied with them and shifted the personnel into relays in such manner that it can be said rarely during the daylight hours were any trucks idle except for the short time they were in for greasing, refueling or being checked-over for defects. This efficiency was particularly noticed in the daily number of loads which were hauled from the clay quarry. Despite the long hours of operation, the first echelon maintenance performed by this section resulted in no losses to the equipment of this section throughout this operation.

REPAIR SECTION

Too much cannot be said of the excellent work performed by this section in this operation. Excellent specialized training, able leadership, and the ability to improvise, enabled this section to reembark from this well mined island with very little loss of equipment. An example of the excellent work performed by this section is demonstrated by the fact that despite the damage done to four TD-18 dozers by mines and Jap shelling which caused the firing of two of these tractors, the battalion returned to the rest camp with five of the six TD-18 dozers initially embarked.

COMMUNICATION SECTION

This section, recently reorganized, experienced little difficulty in maintaining both wire and radio communication with the equipment and personnel made available. However, expected demands which will be placed upon this battalion as extended engineering

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Fourth Engineer Battalion - Operation Report - IWO JIMA - (cont'd)

missions no doubt will continue to gain in importance, substantiates the increase in personnel and equipment as recommended in Section V.

LETTER COMPANIES

The letter engineer companies were never under the operational control of the Engineer Battalion Headquarters. Throughout various periods during the operation the companies changed from operating as a company under the company commander to operating as three platoons, each receiving its orders directly from the Landing Team Commander to the engineer platoon leader. At times the platoons would take direct orders from the rifle company commander in whose area they were working. In a few instances the engineer company commander employed the entire company at the direction and upon the order of one of the battalion commanders. At all times a small section of 5 or 6 men were attached to each infantry company for the purpose of immediately investigating mines or booby traps when and if found.

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WINTERIZING

*
ANNEX "DOG"

SUPPLY

1. Prior to embarkation for the operation, the status of supply within this battalion was very good. All supplies and equipment were on hand to fill anticipated requirements for the operation. The motor transport vehicles and engineer equipment carried by this battalion are shown in the Vehicle Landing Chart. The fact that CT attachments were in effect necessitated the loading of equipment and supplies on 4 AKA's and 11 APA's throughout the Division shipping. (See Distribution of Engineer Equipment and Vehicle Chart.)
2. The supply problem confronting this battalion after landing was not a difficult one due to the fact that the lettered engineer companies remained attached to the CT's throughout the operation. Other than the fact that there were too few sandbags available for protection of the water distillation plants, supply presented no problem.
3. Salvage commenced within the battalion area on D+6 days and was conducted by a salvage section organized within Headquarters and Service Company consisting of one (1) NCO (QM Personnel) and a working party of five (5) men. Many items of individual equipment and some weapons were salvaged and turned into the Division salvage dump. Salvage continued for four (4) days until the entire battalion area had been checked and all salvageable items removed.
4. The total loss of engineer equipment and vehicles for this battalion during the operation was as follows:

<u>ITEM</u>	<u>REMARKS</u>
1-TRUCK, 2 $\frac{1}{2}$ Ton, 6x6, cargo	Was never landed on beach.
1-TRACTOR, hvy, w/ang doz (TD-18)	Destroyed by land mine.
1-TRACTOR, hvy, w/ang doz (TD-14)	Destroyed by land mine.
*1-TRACTOR, lt, w/crane (TD-9)	Destroyed on beach by shell.
*1-SHOVEL, 3/8 cubic yard	Destroyed on beach by shell.

*NOTE: This equipment was attached to
the 4th Pioneer Battalion for
use on Shore Party work.

Parts from the above vehicles were salvaged and used to repair other vehicles during the operation.

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Fourth Engineer Battalion - Operation Report - IWO JIMA - (cont'd)

5. The road net in the Division zone of action was such that all points were accessible. All roads were of sufficient width and surfaced so as to permit two-way traffic in all types of weather.

Establishment of traffic control points at all major intersections in the Division zone, manned by experienced military police, served to maintain a smooth flow of traffic at all times. Despite the volume of traffic, the road net was adequate to support the operation and the problem of traffic circulation never became serious.

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Fourth Engineer Battalion - Operation Report - IWO JIMA (cont'd)

EXPENDITURE OF EXPLOSIVES DURING OPERATION

<u>ITEM</u>	<u>AMOUNT EXPENDED</u>
CAPS, blasting, special, electric	9,775
CAPS, blasting, special, non-electric	40,000
CORD, detonating, 100ft spools (spools)	1,830
DETONATOR, 15-second delay, M-1	5,682
EXPLOSIVE, C-2 (pounds)	75,000
EXPLOSIVE, demol, chain of eight blocks, M-1. . .	440
EXPLOSIVE, shaped-charge, 40lb, T-3	178
EXPLOSIVE, TNT, $\frac{1}{2}$ lb block,. (pounds)	28,080
FUZE, blasting, time (feet)	92,200
LIGHTERS, fuze	15,000
TORPEDOES, bangalore, M1A1. (sections)	2,020

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ENGINEER BN. EQUIPMENT & VEHICLE LANDING CHART

ONCE AGAIN

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DISPOSITION OF ENGINEER EQUIPMENT & VEHICLES

CT 23 SHIPPING	CT 24 SHIPPING	CT 25 SHIPPING
<u>APA-196 ("C" Co. HqPlt Equip)</u> 1 TRACTOR, hvy, w/doz back dump scrap. 1 TRAILER, 1-ton, 2-W, cargo. 1 TRUCK, $\frac{1}{2}$ -ton, 4x4. 2 TRAILERS, 1-ton, 2-W, water. 3 TRUCKS, $2\frac{1}{2}$ -ton, 6x6, dump.	<u>AK-65 (H&S Co. Equip)</u> 1 AMBULANCE, $\frac{1}{2}$ -ton, 4x4. 6 TRACTORS, hvy, w/ang.dozer (TD-18). 2 TRACTORS, hvy, w/PCU. 1 TRACTOR, light, w/doz shovel. 1 TRACTOR, airborne. 3 TRAILERS, $\frac{1}{2}$ -ton, 2-W, dump. 3 TRAILERS, 1-ton, 2-W, cargo. 1 TRAILER, 1-ton, 2-W, greasing. 1 TRAILER, 1-ton, 2-W, stockroom. 3 TRAILERS, 1-ton, 2-W, water. 1 TRAILER, 2-ton, 4-W, cargo. 2 TRAILER, 2-ton, 4-W, stockroom. 1 TRAILER, 5-ton, 4-W, mach. shop. 3 TRUCKS, $\frac{1}{2}$ -ton, 4x4. 6 TRUCKS, 1-ton, 4x4, cargo. 1 TRUCK, $2\frac{1}{2}$ -ton, 6x6, cargo. 12 TRUCKS, $2\frac{1}{2}$ -ton, 6x6, dump. 1 TRUCK, $2\frac{1}{2}$ -ton, 6x6, wrecking. 1 COMPRESSOR, air, 105 cfm. 9 WATER DISTILLATION PLANTS. 1 RIPPER, 2-wheel. 2 SCRAPERS, 4-whl, FD 8 cu. yd.	<u>APA-157 (H&S Co. Equip)</u> 1 TRUCK, $\frac{1}{2}$ -ton, 4x4. <u>APA-120 ("A" Co. HqPlt Equip)</u> 1 TRACTOR, hvy, w/doz back dump scrap. 2 TRAILERS, 1-ton, 2-W, cargo. 1 TRUCK, $\frac{1}{2}$ -ton, 4x4. 2 TRUCKS, 1-ton, 4x4, cargo. 3 TRUCKS, $2\frac{1}{2}$ -ton, 6x6, dump. 1 COMPRESSOR, air, 105 cfm. 1 TRUCK, $2\frac{1}{2}$ -ton, 6x6, cargo. 5 WATER DISTILLATION PLANTS. 1 TRAILER, 1-ton, 2-W, water.
<u>AKA-60 ("C" Co. HqPlt Equip)</u> 1 TRAILER, 1-ton, 2-W, cargo. 2 TRUCKS, 1-ton, 4x4, cargo. 1 COMPRESSOR, air, 105 cfm. 7 WATER DISTILLATION PLANTS. 1 TRUCK, $2\frac{1}{2}$ -ton, 6x6, cargo.		<u>AKA-66 ("A" Co. HqPlt Equip)</u> 2 WATER DISTILLATION PLANTS.
<u>APA-158 ("C" Co. 1stPlt Equip)</u> 1 TRUCK, $\frac{1}{2}$ -ton, 4x4. 1 TRAILER, $\frac{1}{2}$ -ton, 2-W, dump.		<u>APA-157 ("A" Co. 1stPlt Equip)</u> 1 TRUCK, $\frac{1}{2}$ -ton, 4x4. 1 TRAILER, $\frac{1}{2}$ -ton, 2-W, dump.
<u>APA-207 ("C" Co. 2ndPlt Equip)</u> 1 TRUCK, $\frac{1}{2}$ -ton, 4x4. 1 TRAILER, $\frac{1}{2}$ -ton, 2-W, dump.		<u>APA-120 ("A" Co. 2ndPlt Equip)</u> 1 TRUCK, $\frac{1}{2}$ -ton, 4x4. 1 TRAILER, $\frac{1}{2}$ -ton, 2-W, dump.
<u>APA-154 ("C" Co. 3rdPlt Equip)</u> 1 TRUCK, $\frac{1}{2}$ -ton, 4x4. 1 TRAILER, $\frac{1}{2}$ -ton, 2-W, dump.	<u>APA-33 ("B" Co. HqPlt Equip)</u> 1 TRUCK, $\frac{1}{2}$ -ton, 4x4. 1 TRUCK, $2\frac{1}{2}$ -ton, 6x6, cargo. 7 WATER DISTILLATION PLANTS.	<u>APA-163 ("A" Co. 3rdPlt Equip)</u> 1 TRUCK, $\frac{1}{2}$ -ton, 4x4. 1 TRAILER, $\frac{1}{2}$ -ton, 2-W, dump.
	<u>AK-65 ("B" Co. HqPlt Equip)</u> 1 TRACTOR, hvy, w/doz back dump scrap. 2 TRUCKS, 1-ton, 4x4, cargo. 2 TRAILERS, 1-ton, 2-W, cargo.	
	<u>APA-118 ("B" Co. 1stPlt Equip)</u> 1 TRUCK, $2\frac{1}{2}$ -ton, 6x6, dump. 1 COMPRESSOR, air, 105 cfm. 1 TRUCK, $\frac{1}{2}$ -ton, 4x4. 1 TRAILER, $\frac{1}{2}$ -ton, 2-W, dump.	NOTE: The following H&S Co. Equipment was embarked aboard AK-67: 1 TRAILER, 15-ton, machinery. 1 GRADER, road, 4-whl, self-propel. 1 GRADER, road, leaning whl, pull.
	<u>APA-156 ("B" Co. 2ndPlt Equip)</u> 1 TRUCK, $2\frac{1}{2}$ -ton, 6x6, dump. 1 TRUCK, $\frac{1}{2}$ -ton, 4x4. 1 TRAILER, 1-ton, 2-W, water. 1 TRAILER, $\frac{1}{2}$ -ton, 2-W, dump.	
	<u>APA-206 ("B" Co. 3rdPlt Equip)</u> 1 TRUCK, $2\frac{1}{2}$ -ton, 6x6, dump. 1 TRUCK, $\frac{1}{2}$ -ton, 4x4. 1 TRAILER, 1-ton, 2-W, water. 1 TRAILER, $\frac{1}{2}$ -ton, 2-W, dump.	

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